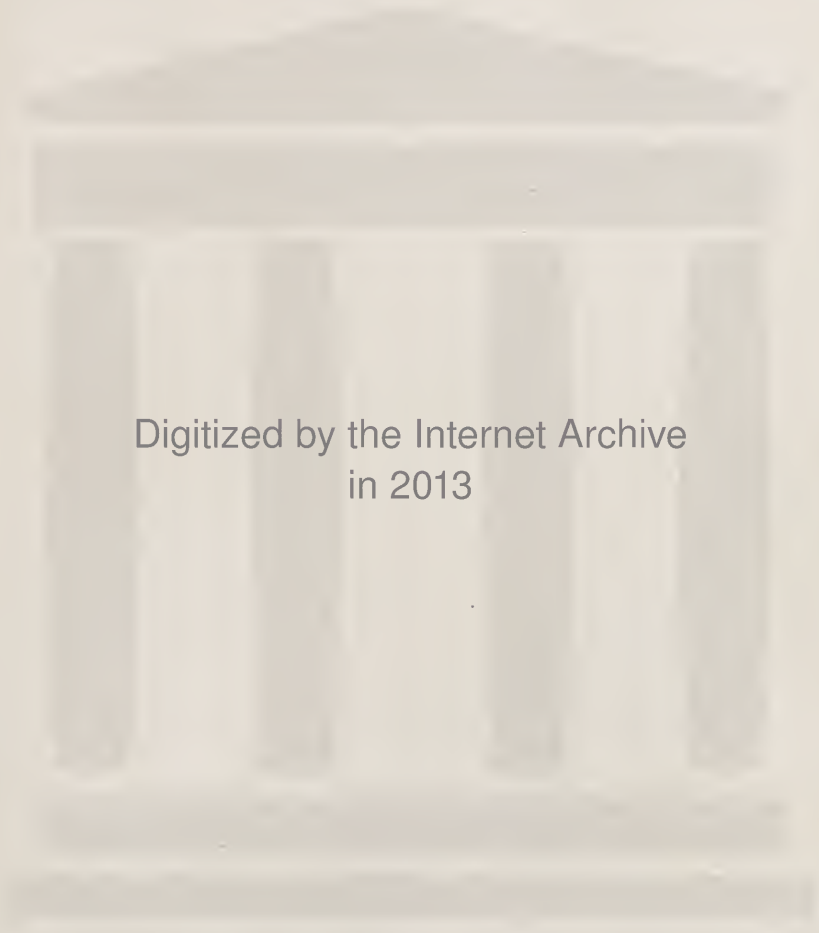
THE NEW HAMPSHIRE COLLEGE BULLETIN

1919



The New Hampshire College of Agriculture and the Mechanic Arts Bulletin

Durham, New Hampshire

APRIL, 1919

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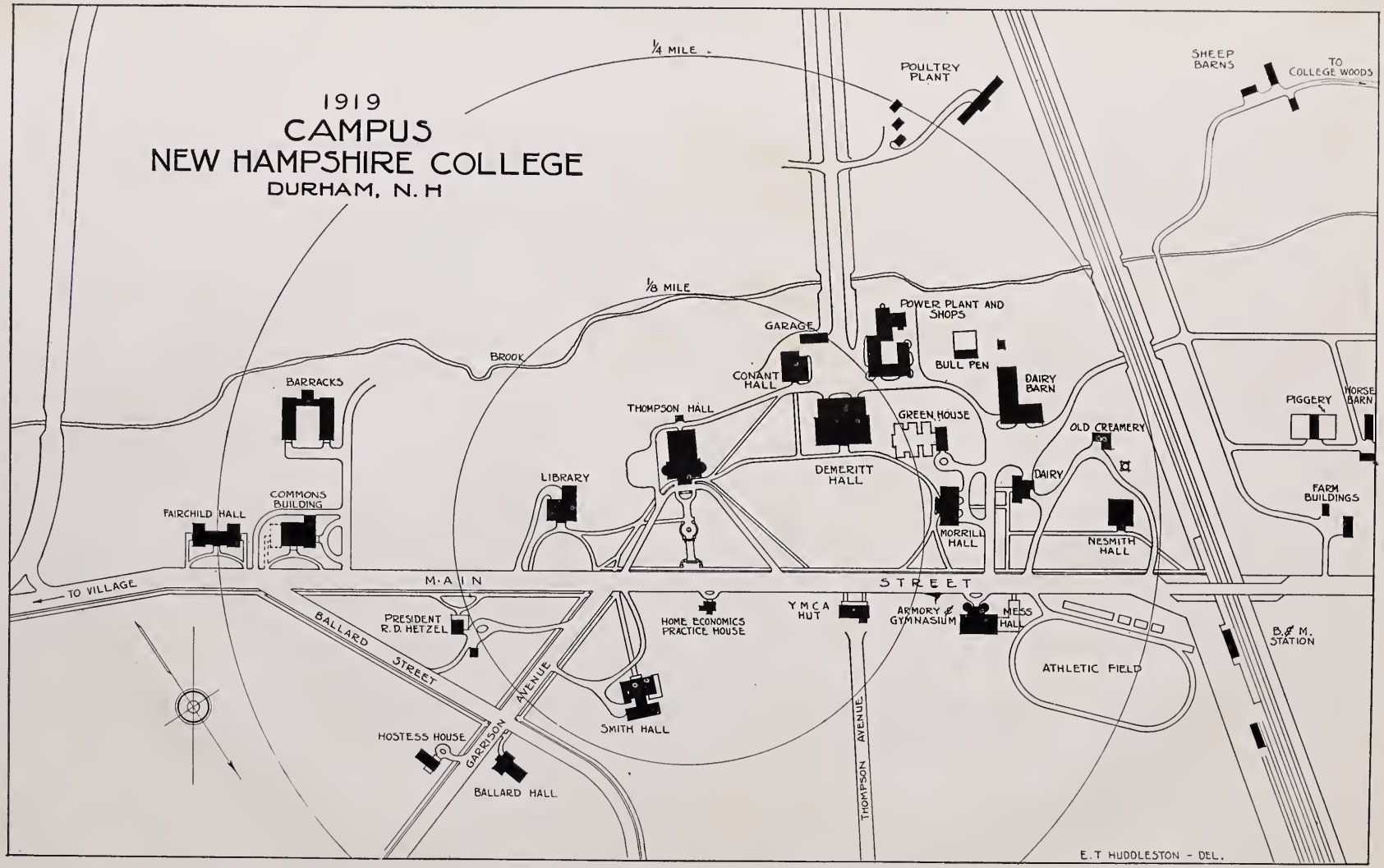


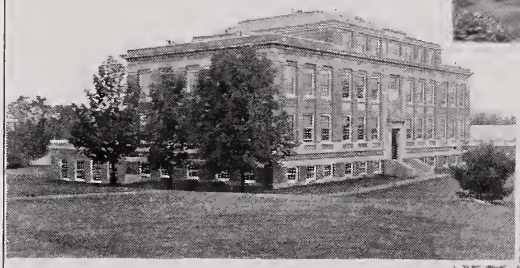
This map shows the buildings of the college and the immediately adjacent grounds. It does not include the college farms, forests, gardens or orchards.

GENERAL VIEW OF CAMPUS

GREENHOUSES

CHEMISTRY BUILDING & SHOPS

THOMPSON HALL
ADMINISTRATION BUILDING



DEMERITT HALL
ENGINEERING BUILDING

GYMNASIUM & DRILL HALL

LIBRARY

PRESIDENT'S RESIDENCE

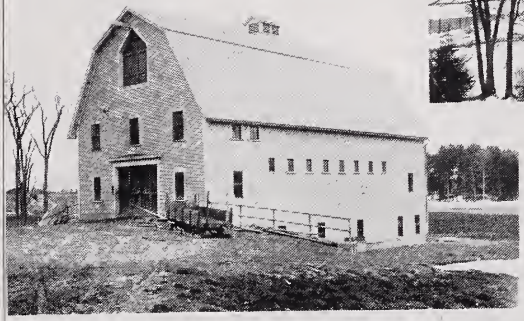
B & M STATION

MORRILL HALL
AGRICULTURAL BUILDING

DAIRY BUILDING

NESMITH HALL
EXPERIMENT STATION

DAIRY BARN



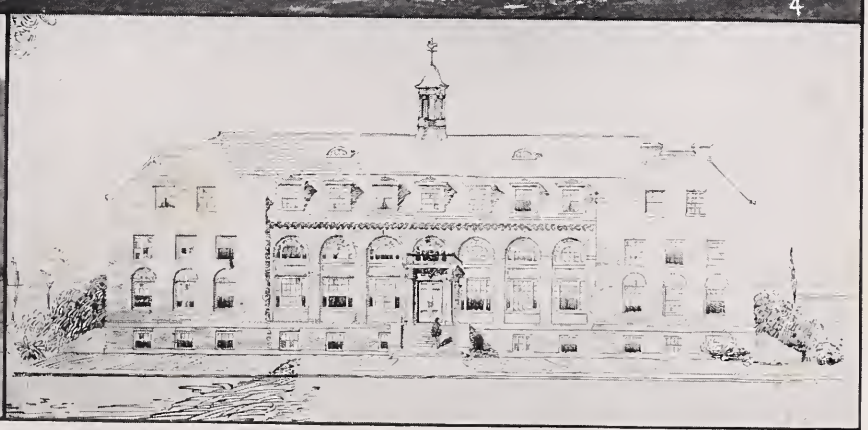
HORSE BARN

HORTICULTURAL FARM BUILDINGS

FAIRCHILD HALL
MEN'S DORMITORY

SMITH HALL
WOMEN'S DORMITORY

BALLARD HALL
WOMEN'S DORMITORY



1. OUR FLAG
2. NEW HAMPSHIRE COLLEGE REGIMENT ON PARADE
3. Y. M. C. A. HUT
4. BARRACKS CONSTRUCTED BY THE S. A. T. C.
5. THE HOME ECONOMICS PRACTICE HOUSE
6. LINE DRAWING OF "THE COMMONS" SHOWING BUILDING AS IT WILL APPEAR WHEN COMPLETED. THE TWO MAIN UNITS WILL BE READY FOR OCCUPANCY THIS FALL

CALENDAR

1919

JANUARY.

S	M	T	W	T	F	S
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
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FEBRUARY.

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MARCH.

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APRIL.

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MAY.

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JUNE.

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JULY.

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AUGUST.

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SEPTEMBER.

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OCTOBER.

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NOVEMBER.

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DECEMBER.

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1920

JANUARY.

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FEBRUARY.

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MARCH.

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APRIL.

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MAY.

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JUNE.

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JULY.

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25	26	27	28	29	30	31
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AUGUST.

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SEPTEMBER.

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OCTOBER.

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17	18	19	20	21	22	23
24	25	26	27	28	29	30
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NOVEMBER.

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DECEMBER.

S	M	T	W	T	F	S
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19	20	21	22	23	24	25
26	27	28	29	30	31	..
..	..	..	..	..	..	..

COLLEGE CALENDAR 1919-1920

1919

FALL TERM

Sept.	16	Monday	Entrance Examinations begin
*Sept.	23	Tuesday	Registration Day
Sept.	24	Wednesday	Recitations begin at 8:00 A. M.
Oct.	8	Wednesday	Annual Meeting of the Board of Trustees
Nov.	5	Wednesday	Mid-Term Warnings to be filed
Nov.	26	Wednesday	Thanksgiving Recess begins at noon
Nov.	28	Friday	Thanksgiving Recess ends at 10:00 A. M.
Dec.	19	Friday	Fall Term closes at 4:00 P. M.

1920

WINTER TERM

Jan.	2	Friday	Registration Day
Jan.	3	Saturday	Recitations begin at 8:00 A. M.
Jan.	14	Wednesday	Meeting of the Board of Trustees
Feb.	11	Wednesday	Mid-Term Warnings to be filed
Mar.	24	Wednesday	Winter Term closes at 4:00 P. M.

SPRING TERM

April	1	Thursday	Registration Day
April	2	Friday	Recitations begin at 8:00 A. M.
April	14	Wednesday	Meeting of the Board of Trustees
May	12	Wednesday	Mid-Term Warnings to be filed
May		Thursday	Junior House Parties begin at 4:00 P. M.
		Sunday	Junior House Parties close, 2:00 P. M.
May	30	Sunday	Memorial Day
June	17	Thursday	Senior Examinations end
June	20	Sunday	Baccalaureate Sermon
June	22	Tuesday	Class Day
June	23	Wednesday	Commencement Day

* New students are urged to present themselves for Registration Monday, September 22.

BOARD OF TRUSTEES

His Excellency, Governor John H. Bartlett, A.B., *ex-officio*

President, Ralph D. Hetzel, A.B., LL.B., LL.D., *ex-officio*

*Hon. Harvey L. Boutwell, B.S., LL.D., *President*	Malden, Mass.
Sept. 1, 1911, to Sept. 1, 1920	
Hon. James A. Tufts, A.B., *Secretary*	Exeter
Jan. 10, 1914, to June 14, 1919	
*Hon. Edward H. Wason, B.S., D.SC.	Nashua
Jan. 16, 1906, to Aug. 1, 1919	
Hon. Richard W. Sulloway, A.B.	Franklin
May 13, 1909, to Oct. 31, 1921	
Hon. William H. Caldwell, B.S.	Peterborough
July 29, 1912, to July 29, 1921	
Hon. Eugene S. Daniell	Greenland
June 14, 1916, to June 14, 1919	
Hon. Roy D. Hunter	West Claremont
June 14, 1916, to June 14, 1919	
Hon. Dwight L. Hall, A.B.	Dover
Oct. 29, 1915, to July 17, 1921	
Hon. Andrew L. Felker	Meredith
July 17, 1917, to July 17, 1920	
Hon. William T. Nichols, A.B.	Manchester
Feb. 15, 1918, to Feb. 15, 1921	
Hon. John C. Hutchins	North Stratford
Oct. 3, 1918, to Aug. 30, 1920	

*Elected by the Alumni.

THE COLLEGE FACULTY* AND TEACHING STAFF

RALPH D. HETZEL, A.B., LL.B., LL.D., *President of the College*

OFFICERS OF ADMINISTRATION

RALPH D. HETZEL, A.B., LL.B., LL.D., *President of the College*
CHARLES H. PETTEE, A.M., C.E., LL.D., *Dean of the College*
FREDERICK W. TAYLOR, B.SC. (Agr.), *Dean of Agricultural Division*
CHARLES E. HEWITT, B.S., M.M.E., *Dean of Engineering Division*
ERNEST R. GROVES, A.B., B.D., *Dean of Arts and Science Division*
—— ——, *Dean of Women*
JOHN C. KENDALL, B.S., *Director of Experiment Station and Extension Work*
HAZZLITT A. VICKERS, B.S.A., *Executive Secretary and Registrar*
WALTER M. PARKER, A.B., *Treasurer*
OREN V. HENDERSON, *Business Secretary*
OSCAR W. STRAW, *Superintendent of Power and Service*

ASSISTANTS IN ADMINISTRATION

MARTHA F. EMERSON, *Librarian*
CHARLOTTE A. THOMPSON, *Assistant Librarian*
CAROLINE A. BARSTOW, *Assistant Librarian*
MARCIA N. SANDERS, *Matron of Smith Hall*
ELIZABETH P. DEMERITT, *Matron of Ballard Hall*
ANNIE J. MORGAN, *Manager of Book Store*
PEARL E. NOLETTE, *Secretary to the President*
BEATRICE M. RICHMOND, *Bookkeeper*
BEULAH M. MADDOX, *Secretary to Business Secretary*
ETHEL A. HITCHINS, *Secretary to Arts and Science Division*
FLORENCE E. WALKER, *Secretary to the Dean and the Registrar*

* The faculty is composed of the president of the college, full professors, associate professors, assistant professors, and the director of the experiment station and extension work.

PROFESSORS†

CHARLES H. PETTEE, A.M., C.E., LL.D., *Dean*
CLARENCE W. SCOTT, A.M., LL.D., *Professor of History*
FREDERICK W. TAYLOR, B.SC. (Agr.), *Dean of Agricultural Division and Professor of Agronomy*
RICHARD WHORISKEY, JR., A.B., *Professor of Modern Languages*
CHARLES E. HEWITT, B.S., M.M.E., *Dean of Engineering Division and Professor of Electrical Engineering*
ERNEST R. GROVES, A.B., B.D., *Dean of Arts and Science Division and Professor of Sociology*
C. FLOYD JACKSON, B.S., A.M., *Professor of Zoölogy and Entomology*
WALTER C. O'KANE, A.M., *Professor of Economic Entomology*
CHARLES JAMES, F.I.C., *Professor of Chemistry*
ALFRED E. RICHARDS, PH.D., *Professor of English*
ORMOND R. BUTLER, PH.D., *Professor of Botany*
JOSEPH H. GOURLEY, M.S., *Professor of Horticulture*
OTTO L. ECKMAN, B.S. (Agr.), *Professor of Animal Husbandry*
ERIC T. HUDDLESTON, B.ARCH., *Professor Architecture and Drawing*
CHARLES L. SIMMERS, A.B., *Professor of Education and Psychology*
WILLIAM H. COWELL, B.S., *Physical and Athletic Director*
KARL W. WOODWARD, A.B., M.F., *Professor of Forestry*
JOHN M. FULLER, B.S., *Professor of Dairy Husbandry*
CHARLES C. STECK, A.B., M.S., *Professor of Mathematics*
HORACE L. HOWES, B.S., PH.D., *Professor of Physics*
HARVARD N. HALLS, MAJOR, U.S.A., *Professor of Military Science and Tactics*

ASSOCIATE PROFESSORS†

‡GEORGE A. PERLEY, M.S., *Associate Professor of Chemistry*
WILLIAM H. WOLFF, M.S., *Associate Professor of Pomology*
LEON W. HITCHCOCK, B.S., *Associate Professor of Electrical Engineering*
HAROLD W. SCUDDER, B.S., *Associate Professor of English*
ALTON W. RICHARDSON, B.S., *Associate Professor of Poultry Husbandry*
FRED C. WERKENTHIN, A.M., *Associate Professor of Botany*

† Arranged in order of seniority of appointment.
‡ Absent on leave.

ASSISTANT PROFESSORS†

Frieda Reiner, b.s., *Assistant Professor of Home Economics*
Olus J. Stewart, a.b., ph.b., m.s., *Assistant Professor of Chemistry*
Marion O'K. McKay, b.s., a.m., ph.d., *Assistant Professor of Economics*
J. R. Hepler, b.s., *Assistant Professor of Vegetable Gardening*
Thomas J. Laton, b.s., *Assistant Professor of Drawing*
Clement Moran, a.b., *Assistant Professor of Physics*
Clifford J. Fawcett, b.s., *Assistant Professor of Animal Husbandry*
Clarence R. Cleveland, a.b., *Assistant Professor of Economic Entomology*
Louise Knight, b.s., *Assistant Professor of Home Economics, and Acting Head of Department*
James H. Marceau, a.b., *Assistant Professor of Modern Languages*
Donald C. Babcock, a.m., b.d., *Assistant Professor of History*
M. Gale Eastman, m.s., *Assistant Professor of Agronomy*

INSTRUCTORS†

James Macfarlane, *Instructor in Floriculture*
Lyman J. Batchelder, *Instructor in Wood Shop and Foundry Practice*
Carl A. Garabedian, *Instructor*
Harold D. McBride, *Instructor in Machine Work and Forging*
Arabella S. Livingston, b.s., *Instructor in Home Economics*
Earl L. Getchell, b.s., *Instructor in Mechanical Engineering, and Acting Head of Department*
Melvin M. Smith, b.s., m.a., *Instructor in Chemistry*
Jesse Pierce, b.s., *Instructor in Mathematics*
Heber F. DePew, b.s., *Instructor in Dairy Husbandry*
Alma D. Jackson, m.a., *Instructor in Zoölogy*
Horace L. Olson, b.s., *Instructor in Mathematics*
Ruth Richardson, a.b., *Instructor in English*
Helen B. Bartlett, *Instructor in Physical Education*
Paul H. Shramm, *Instructor in Drawing*
Victor W. Bennett, a.m., *Instructor in Accounting and Sociology*
James Hayes, *Sergeant*
Gustave Wolff, *Sergeant*

ASSISTANTS†

Heman C. Fogg, b.s., *Assistant in Chemistry*
Irene M. Huse, b.s., *Assistant in Sociology*
B. E. Huggins, *Assistant in Dairy Husbandry*

† Arranged in order of seniority of appointment.

SPECIAL INSTRUCTORS

FOR THE STUDENTS' ARMY TRAINING CORPS

J. S. WELCH, *Auto Truck Division*, S.A.T.C.
H. W. SANDERS, *Auto Truck Division*, S.A.T.C.
E. H. WATSON, *Auto Truck Division*, S.A.T.C.
L. N. PAINE, *Auto Truck Division*, S.A.T.C.
S. H. CRAIG, *Concrete Division*, S.A.T.C.
J. H. KING, *Concrete Division*, S.A.T.C.
A. L. WALES, *Carpentry Division*, S.A.T.C.
J. H. CROSBY, *Carpentry Division*, S.A.T.C.
C. H. CROWELL, *Carpentry Division*, S.A.T.C.
H. T. GRANT, *Carpentry Division*, S.A.T.C.
HARRY BICKFORD, *Carpentry Division*, S.A.T.C.
ROBIN BEACH, *Electrical Division*, S.A.T.C.
P. F. CASEY, *Electrical Division*, S.A.T.C.
L. W. CROSSLEY, *Electrical Division*, S.A.T.C.
F. S. FARNHAM, *Electrical Division*, S.A.T.C.
B. A. LOUGEE, *Electrical Division*, S.A.T.C.
H. A. CROUSE, *Blacksmith Division*, S.A.T.C.
L. W. MCARTHUR, *Cooks and Bakers Division*, S.A.T.C.

NOTE.—In addition to the regular college faculty, it was found necessary to secure a number of additional instructors. The above named men devoted themselves wholly to S.A.T.C. work.

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION

BOARD OF CONTROL

Pres. R. D. Hetzel, a.b., ll.b., ll.d., *ex-officio*	Durham
Hon. W. H. Caldwell, b.s.	Peterborough
Hon. E. S. Daniell	Greenland

THE STATION STAFF

Ralph D. Hetzel, a.b., ll.b., ll.d., *President*
John C. Kendall, b.s., *Director*
F. W. Taylor, b.sc. (Agr.), *Agronomist*
W. C. O'Kane, a.m., *Entomologist*
J. H. Gourley, m.s., *Horticulturist*
O. R. Butler, ph.d., *Botanist*
E. G. Ritzman, b.s., *Animal Husbandman*
K. W. Woodward, a.b., m.f., *Forester*
J. M. Fuller, b.s., *Dairy Husbandman*
W. H. Wolff, m.s., *Assistant Horticulturist*
T. O. Smith, a.b., m.s., *Research Chemist*
C. R. Cleveland, b.s., *Assistant Entomologist*
J. R. Hepler, b.s., *Assistant in Vegetable Gardening*
F. C. Werkenthin, m.a., *Assistant Botanist*
M. G. Eastman, m.s., *Assistant Agronomist*
James Macfarlane, *Florist*
A. D. Littlehale, *Shepherd*

ASSISTANTS TO THE STAFF

Martha F. Emerson, *Librarian*
O. V. Henderson, *Purchasing Agent*
Beatrice M. Richmond, *Bookkeeper*
Elizabeth E. Mehaffey, *Assistant Librarian and Mailing Clerk*
Beatrice E. Carlisle, *Stenographer*
Betty I. Glidden, *Stenographer*
Christina M. Collins, *Stenographer*

NEW HAMPSHIRE COLLEGE
EXTENSION SERVICE

GENERAL EXTENSION STAFF

RALPH D. HETZEL, A.B., LL.B., LL.D., *President*
J. C. KENDALL, B.S., *Director of Extension Work*
E. P. ROBINSON, B.S., *County Agent Leader*
BERTHA E. TITSWORTH, B.S., *State Home Demonstration Leader (Rural)*
MARY I. WOOD, *Urban State Home Demonstration Leader*
L. A. CARLISLE, B.S., *State Leader Boys' and Girls' Club Work*
L. F. BROWN, B.S., *Agent in Dairying*
A. B. GENUNG, B.S., *Farm Management Demonstrator*
C. S. VAN NUIS, *Extension Animal Husbandman*
C. A. CRAMPTON, JR., *Extension Poultry Husbandman*
MARY L. SANBORN, *Asst. State Leader Boys' and Girls' Club Work*
ISA A. GREENE, B.S., *Asst. State Home Demonstration Leader*
MARION E. CATON, *Emergency Home Demonstration Agent at Large*
LAURA H. WOODRUFF, *Emergency Home Demonstration Agent at Large*

COUNTY AGENTS

F. N. DARLING, B.S., *Cheshire County*
A. G. DAVIS, B.S., *Merrimack County*
R. E. DEUEL, B.S. *Rockingham County*
R. J. BUGBEE, B.S., *Carroll County*
C. A. SMITH, B.S., *Hillsborough County*
R. W. SMITH, D.V.M., *Belknap County*
W. C. STOKOE, B.S., *Coös County*
H. N. WELLS, *Sullivan County*
W. R. WILSON, B.S., *Grafton County*
R. S. WETHERBEE, B.S., *Strafford County*

ASSISTANT COUNTY AGENTS

——— ———, *Grafton County*
——— ———, *Coös County*
F. D. ELLSWORTH, B.S., *Merrimack County*
L. B. ROBINSON, B.S., *Hillsborough County*
D. D. WARD, B.S., *Rockingham County*

COUNTY HOME DEMONSTRATION AGENTS

HARRIET A. ACKERLY, *Cheshire County*
ANN F. BEGGS, *Hillsborough County*
PEARL A. GRANT, B.S., *Merrimack County*
MARION E. HUCKINS, *Grafton County*

Florence P. Hubbard, *Strafford County*
Helen F. McLaughlin, b.a., *Rockingham County*
M. Roseland Tilden, *Belknap County*
Kathryn E. Woods, *Sullivan County*

COUNTY CLUB LEADERS

Alice J. Ballard, *Grafton County*
F. W. Hall, b.s., *Carroll County*
Beulah I. Hazard, *Hillsborough County*
H. B. Little, b.s., *Coös County*
J. E. Miltimore, b.s., *Cheshire County*
H. A. Mostrom, b.s., *Merrimack County*
V. A. Perkins, b.s., *Sullivan County*
M. Roseland Tilden, *Belknap County*
C. B. Wadleigh, b.s., *Rockingham County*
Mary A. Worcester, b.s., *Strafford County*

EMERGENCY HOME DEMONSTRATION AGENTS (Urban)

Dorothy Emerson, *Nashua District*
Alice H. Griffin, *Portsmouth-Dover District*
Ada D. Lockhart, *Berlin District*
Hazel R. Porter, *Manchester District*
M. Frances Wiggin, *Exeter-Derry District*
R. Olive Wilkins, *Manchester District*

ASSISTANTS TO THE STAFF

H. B. Stevens, *Editorial and Recording Secretary*
Martha E. Fisher, *Stenographer*
Esther L. Hobby, *Stenographer*
Anna E. Stevens, *Stenographer*
Olive E. Morgan, *Stenographer*

HISTORICAL SKETCH

The New Hampshire College of Agriculture and the Mechanic Arts was created by an act of the New Hampshire legislature in 1866 and was established at Hanover as a state institution, in connection with Dartmouth College. In its foundation the state legislature had accepted the conditions of an act of the federal congress of July 2, 1862, entitled "An act donating public lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts." The state had accepted the land grant three years earlier, July 9, 1863.

In 1893 the college was moved from Hanover to Durham. This action followed the death of Benjamin Thompson, a farmer of Durham, who died January 30, 1890, and left to the college his entire estate, excepting a few minor reservations. The legislature accepted this bequest March 5, 1891, and appropriated the necessary money for the first buildings.

Mr. Thompson wrote in his will, "My object being mainly to promote the improvement of agriculture, though willing that the college to be established should also provide for the mechanic arts, it is my will that the institution to be established by the state . . . shall be called and designated . . . The New Hampshire College of Agriculture and the Mechanic Arts, if that shall be the wish of the state; and that in addition to the instruction to be given therein, as provided by my said will, there shall be taught only such other arts or sciences as may be necessary to enable said state to fully avail itself of said donation of lands by the government in good faith, which two branches of instruction shall be the leading objects of said institution or college."

Shortly before the state accepted this bequest of Mr. Thompson the legislature further provided for the college by

accepting the provisions of an act of congress known as the Morrill Bill. This legislation made available federal appropriations "for instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic science, with special reference to their applications in the industries of life, and to the facilities for such instruction."

Although the college was able to make use of the Thompson land as early as 1893, it was not until 1910 that the income from this endowment of almost $800,000 became available. At present the college has an annual income from the Thompson funds of nearly $32,000. It also receives the moneys which are available as the result of the acts of congress referred to, and the biennial appropriations of the state legislature.

The college administration is in charge of a board of thirteen trustees. The governor of the state and the president of the college are *ex-officio* members. The college alumni elect two trustees, and the others are appointed by the governor with the advice and consent of the council.

EXPERIMENT STATION

A branch of the college, known as the New Hampshire Agricultural Experiment Station, was established by the state, August 4, 1887, under an act of congress of March of that year. Its purpose is to acquire agricultural knowledge and to bring its information to the people of the state. The station is actively engaged in this work not only in Durham but throughout the commonwealth. Members of the agricultural faculty of the college serve on the station staff.

EXTENSION SERVICE

Extension work in agriculture has been carried on in New Hampshire by members of the college and station staffs ever since the organization of New Hampshire College and Experiment Station. The first financial aid specifically for non-resident teaching or extension work, however,

came in 1911 when the New Hampshire legislature appropriated a sum of money for this purpose. In May of the same year the board of trustees recognized the extension activities of the college as being among the important functions of the institution and appointed a director of extension work.

The passage of the Smith-Lever law three years later, which provided the state with federal funds for conducting extension work in agriculture and home economics, gave a decided impetus to this type of teaching. During the last four years the extension service of New Hampshire College has grown rapidly, and its activities have been greatly increased.

The number of extension workers has been increased until there are at present fifty-three members of the extension staff giving full time to the service. The members of the college and station staffs also contribute a large amount of time and render valuable assistance in carrying out the extension program.

SMITH-HUGHES WORK

The enactment by the federal government of the Smith-Hughes law in 1917 made available to the state of New Hampshire $15,000; federal moneys to be matched by an equal amount of state or local moneys. One third of this is to be used in the training of teachers of agriculture, home economics, and industrial education. Two thirds of the amount is to be used in partial payment of the salaries of teachers of these subjects in those public secondary schools which meet the requirements as set up by the Federal Board for Vocational Education in regard to teachers, equipment, etc. The New Hampshire State Board for Vocational Education has designated the state college as the institution which shall do the teacher training work provided for in this act.

VOCATIONAL SECTION—STUDENTS' ARMY TRAINING CORPS

With the declaration of war against Germany, the administration and faculty of New Hampshire College desired that the institution serve the government in every way possible.

The college year was closed May 1, 1918, six weeks earlier than usual, and on May 16, 1918, the first detachment of U. S. Army soldiers, men carefully chosen because of their previous training or experience, arrived for special vocational training. The vocational work was carried on with detachments coming and going throughout the season, until December 14, 1918, when the last detachment left.

Ten different kinds of vocational work were organized and carried forward. The following table gives statistics of the different divisions:

Division	*No. Men*	*Construction Work*
Auto Truck	308	200 cars repaired.
Concrete	197	2,742 sq. yds. sidewalk and 1143 cubic yds. foundation laid.
Carpentry	339	8 large, 4 medium and 3 small buildings constructed. Only 3 of the 15 were temporary.
Electrical	206	Several buildings wired. Wiring difficulties overcome.
Blacksmith	50	Large amount of auto repair and other work done.
Machinist	87	Large amount of auto repair and other work done.
Gas Engine	42	Large amount of auto repair and other work done.
Topographical Drafting	7	Plans made for use of other divisions.
Cooks and Bakers	17	Practical work in mess hall.
Clerks	16	Practical work at military headquarters office.
Total	1,269	Soldiers given special training.

COLLEGIATE SECTION—STUDENTS' ARMY TRAINING CORPS

When the War and Navy Departments announced their policy with reference to the using of colleges for the training of student candidates for officers' positions in the army and navy, the entire teaching staff of the college was eager to coöperate in the carrying out of this new military policy of the government, and a collegiate section of the Students' Army Training Corps was at once organized. With no hesitation a program of studies was constructed according to the wishes of the government. Members of the faculty having no opportunity to teach their special subjects, in the spirit of unquestioning patriotism accepted the instruction of such subjects in the government's program as they were qualified to teach.

The Collegiate Section followed explicitly from the first the needs of the government without regard to academic tradition or former educational policies at the institution. Because of this the college from the beginning received the commendation of the visiting representatives of the War Department, both for the efficiency of the instruction offered and the unqualified effort of the institution to fulfill the purposes of the Collegiate Section.

SITUATION

Durham, the home of the college, is an attractive village on the Portland division of the Boston and Maine railroad, sixty-two miles from Boston, fifty-four from Portland, Me., and five from Dover, N. H., a city of 13,000 population. Good train service makes the college easily accessible from all parts of the state.

Durham is one of the historic towns of New Hampshire. In the early days it was the home of a prosperous shipbuilding industry. Situated at the head of tidewater on the Oyster River, it served as a distributing center for the interior of the state. During the Revolutionary War it was famous as the home of General John Sullivan. Near his home, in the village, the state has erected a fitting monument to his memory.

BUILDINGS AND EQUIPMENT

BUILDINGS

The frontispiece form with its accompanying cuts give a fair idea of the buildings of the college. While systematically arranged in groups, they are scattered over a considerable area and thus make up a very attractive campus.

Thompson Hall is the main administration building and from its eminence commands a view of the entire campus. It contains, besides recitation rooms, the offices of the president, dean, registrar, business secretary, bookstore, and headquarters of the departments of modern languages, English, education and psychology, zoölogy, economic entomology, and home economics. The gymnasium for women is also in this building.

Morrill Hall is the headquarters of the agricultural division of the college and also has the office of the director of the experiment station and the experiment station

library. In this building are the laboratories and lecture rooms of the departments of agronomy, animal husbandry, horticulture, poultry husbandry, and forestry. The building also contains a collection of farm implements and a cattle-judging room. The third floor provides quarters for agricultural extension workers, a reading room for agricultural students, and The Agricultural Club Room.

DeMeritt Hall.—The engineering building is the most prominent of the engineering group, and houses the departments of mechanical engineering, electrical engineering, physics, drawing and mathematics. It contains lecture, recitation, drawing, and office rooms for the several departments; also electrical, mechanical and physical laboratories, each one adapted to and equipped for its specific work.

Conant Hall is devoted exclusively to the department of chemistry. The second floor, containing lecture rooms and three laboratories, remains substantially as it has been for a number of years. The first floor has been recently fitted up with modern chemistry desks and other equipment to supply much needed additional laboratory facilities for students in chemistry. The building is thus well equipped for carrying on the chemical courses of the college, including those connected with chemical engineering, agriculture, and home economics.

The Library.—In accordance with an act of consolidation between the libraries of Durham and the college, the books of the Durham public library and the college are all shelved in one building, forming the Hamilton Smith Public Library. This consolidation makes an especially good collection, the scientific books of the college supplementing well the more popular books of the town library. The consolidated libraries number about 33,000 volumes and the reading room is supplied with 84 periodicals. The departments of sociology, of history and political science, and of economics are located in the library building.

Aside from the main library, each department has its working library of the more technical books and journals.

The library as a whole subscribes for 230 periodicals; 84 of them, non-technical in character, are kept in the periodical and children's rooms; the rest, in the various departmental libraries. Numerous daily and weekly papers are received by the library.

The Dairy Building is well arranged and equipped for purposes of dairy instruction. It contains a commercial creamery, with sanitary milk room, separator room, churning room, and cold storage room; laboratories for instruction in milk testing, milk inspection, farm butter and cheese-making, and bacteriology; also a reading and exhibition room; a class room and offices.

The Shop Buildings consist of a woodworking shop, a machine shop, a forge room, a foundry, the boiler house, and a general repair shop connected with the power and service department.

Two additions were made to the shops by the carpentry and concrete sections of the New Hampshire College U. S. Army Training Detachment during the fall of 1918. The first addition is a two-story building 32 feet by 60 feet, the first story being devoted to machine work and the second story devoted to woodwork. The second addition is a two-story and basement building, 32 feet by 89 feet. Both of the main floors will be devoted to woodworking machinery.

Locker rooms with lockers are provided for use of students taking subjects in shop work.

Nesmith Hall is occupied by the departments of chemistry and botany of the experiment station, and contains the laboratories of the department of botany of the college.

The Armory and Gymnasium contains the offices of the commandant and physical director, the rooms of the College Club and a large drill hall and gymnasium.

President's House.—The present structure is a substantial, attractive residence, erected in 1904 at an expense of $9,000. It replaced the original wooden structure which was burned in 1903.

Commons Buildings.—The legislature of 1917 provided $100,000 for erecting a much needed commons building. Disturbed conditions arising from the war prevented its construction in 1917. However, the contract calls for its completion in time for occupancy in September, 1919.

The building will provide convenient boarding facilities for the student body, by means of which it is expected the cost of board will be considerably lessened.

Fairchild Hall.—This building, erected in 1916 at a cost to the state of $60,000, was named in honor of the late president of the college. It is a handsome brick structure of colonial design, which furnishes accommodations for 106 men.

Dormitories for Women.—Smith Hall was made possible by the generosity of Mrs. Shirley Onderdonk, of Durham, who gave $16,000 as a memorial to her mother, Mrs. Alice Hamilton Smith. The remainder of the cost, $10,000, was provided by the state. By the aid of the carpentry and concrete divisions of the S.A.T.C., an annex has been added to the rear of the hall, which greatly increases the rooming facilities. The hall now accommodates 68 instead of 32 women, besides furnishing dining facilities for 125 women.

Ballard Hall is the second woman's dormitory owned by the college. At a cost to the state of only $12,000 it furnishes desirable accommodations for 45 women.

Each dormitory has a large reception room for social use. A competent matron is in charge of each building.

The Health Service.—A house in the village has been acquired by lease and is used partly as an overflow for the two women's dormitories, and partly as an infirmary for the care of students. A competent matron, who is also an experienced nurse has been secured, and the building has more than justified itself by its usefulness in the care of influenza patients.

Hostess House.—Through the efforts of the New Hampshire Federation of Women's Clubs, and the national

Y. W. C. A., a large house in the village has been leased and fitted up as a hostess house. Friends of students and visitors to the college may obtain temporary accommodations at reasonable rates, and the parlors are open constantly for the benefit of students. Located in a small village with no hotel facilities, the college is fortunate indeed to secure the double advantage of accommodations for its friends and supervised assistance in promoting the social life of the student body.

Practice House.—A modern house owned by the college and conveniently located on the college campus has been fitted up this year as a practice house for home economics students. Here they live during six weeks of their senior year, taking their turn at performing the varied household tasks under competent supervision.

Farm Buildings.—Besides the above, there are numerous farm and other buildings adapted to the needs of the several departments.

EQUIPMENT

Agronomy.—For the teaching of farm equipment and machinery, this department is provided with drainage levels for laying out drains, plane tables for making farm maps, polar planimeters for measuring plotted areas, a dynamometer and several other pieces of apparatus for studying draft problems. For farm crops work it has a very complete collection of dried specimens of the different forage crops, and the more important varieties of corn, wheat and oats. Seed testing apparatus, grass charts and other illustrative material form a part of the equipment.

The lecture room is equipped with a combined lantern and reflectoscope, together with a large number of lantern slides.

The soil physics laboratory contains soil bins, a compacting machine, chemical and torsion balances and various kinds of physical apparatus for the study of soils, including

that for the determination of specific gravity and for the making of mechanical analyses.

The agricultural museum contains the original "Daniel Webster plow" and other primitive models. It also contains many of the latest types of farm machinery, including plows, cultivators, harrows, mowers, planters, corn and grain binders, a thresher, manure spreader, different kinds of cattle ties, various makes of woven wire fences, etc.

The college farm, with its 500 acres of land, has a variety of soils suited for the growth of various farm crops. Land on nearby farms is rented for the growing of corn and potatoes so that good opportunities are afforded for practical work and demonstration in the production of field crops.

Animal Husbandry.—For the various subjects in animal husbandry use is made of the live stock of the college farm. The college owns a number of horses representing the draft type, and recently purchased two of the best pure bred Percheron mares in New England. In order to become acquainted with the carriage and roadster types, the students are taken to various stock farms where these types may be inspected and judged. For the study of sheep, the experiment station flock is used. During the past summer a modern piggery, capable of housing twelve brood sows with litters, was erected. In the agricultural building a large room is fitted up for the judging of live stock, and score cards with a scale of points for each kind of animal are used.

The 1919 legislature has appropriated $10,000 for a stock barn and $5,000 for live stock. This will provide for the purchase of pure bred beef cattle, sheep and swine, and will materially strengthen the equipment of the department.

The class room is provided with a stereopticon lantern and a large collection of lantern slides used to show the leading individuals of the different breeds of live stock. The herd books of the most prominent breeds are used for the purpose of familiarizing the student with the methods of tracing pedigrees and with the practices of breeders' associations.

Architecture and Drawing.—The department of architecture and drawing is well equipped to meet the needs of the subjects offered. The drafting rooms are supplied with tables and lockers and the free-hand studio with suitable stands and easels. For engineering and machine drawing there is an excellent collection of working models and machine parts, and various machines in other departments are available for this work. For free-hand drawing there is a good supply of geometric models, and for advanced work in charcoal drawing the nucleus of a good collection of plaster casts exists, consisting of historic ornament, details of plant and animal life and of the human form. For special work in this subject there is available the museum of casts, consisting of examples of antique and modern sculpture. For work in architectural drawing an excellent library of books and periodicals and blue prints of all classes of buildings are available for reference and use in the drafting rooms, while a goodly collection of samples of building materials is being added to from time to time.

Botany.—The department of botany has the usual laboratory equipment to meet the needs of the courses in general botany, plant physiology and bacteriology. In the advanced courses, owing to the connection of the department with the experiment station, students will find both the laboratory and greenhouse equipment ample for critical studies of plant diseases and plant nutrition.

Chemistry.—The several chemical laboratories are fairly well equipped. Each is supplied with most of the forms of apparatus required for its particular work. Besides all necessary glass and porcelain ware, this includes water baths, drying ovens, combustion furnace, muffle and assay furnaces, platinum dishes and crucibles, polariscope, spectroscope, balances, lantern and other lecture appliances.

Dairy Husbandry.—The dairy husbandry department offers excellent opportunities for instruction in technical and practical dairy work. The college creamery has all necessary machines and equipment. Electric motors fur-

nish power for the different machines. Milk from the college herd and milk and cream from nearby farms give sufficient material for the different laboratories. In the farm dairy room are hand separators and hand and small power churns. The milk testing and milk inspection laboratory is equipped with Babcock testers and other apparatus. The bacteriological laboratory has equipment necessary for instruction in dairy bacteriology.

The college dairy herd consists of representatives of the Guernsey, Jersey, Ayrshire, and Holstein breeds. Use is made of the herd for laboratory instruction in certain dairy husbandry subjects.

Electrical Engineering.—The laboratories for electrical engineering occupy the ground floor of the south end of DeMeritt Hall. The main laboratory is 104 feet by 36 feet and is used for testing dynamo electric machinery. In this main laboratory there is a large distributing switchboard, on which are mounted instruments, switches, circuit breakers, ground detectors, synchronizers and plugging devices so arranged that it is possible to connect the various rooms and convey thereto direct current and single, two-phase and three-phase alternating current of different voltages and frequencies.

In addition to this main laboratory there is a laboratory used for photometry, one for storage battery and one for high potential experiments. The laboratories are also provided with an instrument room, a mechanician's room and a dark room.

The general equipment of the laboratory includes various dynamos and motors for direct and alternating current, several transformers, one 75,000 volt high potential transformer, and the necessary measuring instruments and storage batteries adapted to the needs of students taking this course.

The department has received as a gift from Sears, Roebuck & Co., of Chicago, Ill., one electric light plant consisting of engine, dynamo, switchboard, and storage bat-

tery. The department has also received as a gift from the Domestic Engineering Company, one of the Delco-light sets including engine, dynamo, switchboard and storage battery. Each of these outfits are of the 32-volt type adapted for isolated plant work. These outfits are available for demonstration, also for laboratory experiments.

In addition to the regular laboratory equipment, there is available for testing purposes a fully equipped sub-station having a capacity of 75,000 watts supplied by the Rockingham County Light & Power Co., of Portsmouth, N. H. A part of this equipment consists of an automatic, polyphase, induction feeder voltage regulator, including contact-making voltmeter and reversing switch.

Farm Department.—New Hampshire College has a large, well-equipped farm. This farm serves as a laboratory for much of the instruction in agriculture where approved methods and practices may be seen and where the students may gain experience by actually performing the work with their own hands.

The college farm proper consists of about 385 acres of which about 100 are in forest and woodland; about 45 are occupied by the campus and athletic field; about 95 are tillage land, and about 145 are pasture land. A part of both the pasture and tillage land is utilized by the agronomy, horticulture, and animal husbandry departments of the experiment station. Small tracts of suitable land on adjoining farms are also rented for experimental purposes.

A farm of 120 acres adjacent to the college farm and having a complete set of buildings, has recently been purchased, primarily for the department of horticulture. This farm contains one of the best orchard sites in this part of the state, about 20 acres of forest and about 50 acres of pasture.

The farm buildings consist of a large dairy barn, a horse barn 36 x 68 with basement and hay storage loft, two sheep barns, and two general storage barns. The dairy barn has two 125-ton silos, storage capacity for about 120 tons of

hay, and a well-appointed, sanitary stable accommodating 40 cows and the usual complement of calves and yearlings. A building 20 x 60 with individual yards has been erected for housing the herd bulls.

Forestry.—The demand for instruction in forestry at the college has been increasing from year to year and the legislature of 1911 provided for a separate department of forestry. The course is intended to provide not only a special training in forestry, but also a broad general training in other lines of agriculture closely related to it. For those who desire to make forestry their life work, every encouragement and assistance will be given. Additional work at some graduate school of forestry is now almost a necessity, owing to the large number of men entering the profession.

Durham is well situated with reference to the study of woodlot forestry. All types of native second-growth forests are found nearby and the college owns a tract of 60 acres of old-growth timber where exceptional opportunities are given for the study of mature forests. There are other areas where practice will be given in establishing plantations of forest trees by various methods. A nursery for the growing of seedling forest trees has been established.

All the necessary instruments for making forest maps and measurements, together with collections of wood specimens, lantern slides and photographs, are available in connection with this work.

Home Economics.—The home economics department is located in two large rooms in Thompson Hall. The food laboratory is fitted with work desks, storage cupboards and apparatus for cooking. The desks are built in cabinet form to hold the necessary utensils and materials for each student. Each table is fitted with both gas and electric stoves and ovens.

The cooking utensils are of the materials best suited to the use of each. Standard measuring apparatus and scales are provided.

A storage cabinet is provided with bins for supplies and cupboard space for large utensils.

The sewing equipment consists of sewing machines, cabinets, tables, and dress-forms.

Various educational exhibits, both food and textile, are owned and used by the department for illustrative purposes.

The reference library of books, bulletins and journals is deposited partly in this room and partly in the main library.

Mechanical Engineering Department.—This department is located in DeMeritt Hall. On the second floor is the drafting room which is given over to advance drawing and designing. In addition to the drafting room there are two lecture rooms, and department offices. One of the lecture rooms is equipped with stereopticon lantern and screen, so that illustrated lectures may be given at any time.

In the basement is located the Mechanical Engineering Laboratory, the north end of which is given over to a materials' testing room, in which are tested all kinds of building materials, oil and fuel. The main room is given over to steam, gas and hydraulic testing. The equipment consists of three gasoline engines, two high speed steam engines, and one 25 H. P. Murray-Corliss. For hydraulic work there are various kinds of meters, weir tanks, and pumps. In addition to the laboratory equipment mentioned there is a supply of indicators, gages, thermometers and other small apparatus for testing and research work.

Military Department.—This department is in charge of an officer of the United States regular army, detailed by the War Department, as a professor of military science and tactics. Military instruction, which is required by law, is both theoretical and practical, the former having special reference to the duties of the line.

The organization is a regiment of two battalions, having a band, and officered by cadets selected for character, soldierly bearing, and efficiency. The federal government has furnished U. S. magazine rifles, model .30 caliber, 1917 (Enfield), and equipment. Attention is paid to rifle

practice, the government supplying ample ammunition and target materials, and the college a range within four minutes' walk of the college buildings, with firing points at 200 and 300 yards. The rolling country in the vicinity of the college furnishes opportunities for extended order drill and field exercises, the athletic field for close order drills, and the gymnasium for indoor work.

The cadets wear, when on duty of a military character, an olive drab cloth uniform as prescribed by standing orders of the War Department. This is furnished by the government.

Service in this department for juniors and seniors is limited to those men who are selected for further training by the President of the college and the Professor of Military Science and Tactics. Those so selected who agree to continue in the department for the remainder of their college course, and to pursue the subject in camp training prescribed by the War Department, receive from the government pay at the rate of the allowance for commutation of rations for the regular service.

Upon the graduation of each class the names of those students who have shown special aptitude for military service are reported to the adjutant-general of the army, and to the adjutant-general of the state, and they receive a special certificate for military proficiency.

Physics.—Besides the necessary furniture, the department is supplied with the usual small tools, calipers, scales, balances, weights, hydrometers, calorimeters, thermometers, etc., and with other apparatus for the performance in the laboratory of experiments in mechanics, heat, sound, light, magnetism and electricity.

The lecture room has a small but growing collection of apparatus for the illustration, both experimentally and with the projection lantern, of the laws of matter and energy in their various relations, and of the history of physics. There has recently been added to the lecture equipment a set of the well-known Evans P. E. D. equipment, which makes it

possible to illustrate most of the phenomena in electrodynamics which are treated in general physics.

Instruction is carried on by means of lectures with stencil outlines furnished to students and constantly kept up to the development of the subjects, recitations and discussions based on standard text-books, and experimental work in the laboratory. Stencil outlines are furnished for the laboratory experiments, with concise directions and references, and reports on the results of their experiments are written by the students for examination and criticism by the instructor.

The physics department occupies most of the west end of the engineering building. In the basement there are two small rooms for individual work, a switchboard room, a room for storage battery and for chemical work, a storage room, and a large laboratory room for work in subjects yet to be developed. On the first floor are the general laboratory, partly divided off into small rooms for work in light or for balances, a room for apparatus storage, the office and a recitation room. On the second floor are the lecture room and a room for the storage of lecture apparatus.

Poultry Husbandry.—The equipment of the poultry department consists of a permanent laying house, accommodating 750 hens, and eight colony houses used to brood chicks and also for housing 250 laying hens. The birds kept number 1,000 and consist of White Leghorns, White Wyandottes, Barred Rocks, and Rhode Island Reds. The plant is run on a strictly commercial basis and all the laboratory work of the various poultry courses is practical in every way, giving the student actual work in the various operations of a commercial poultry plant. There are 17 incubators of three standard makes, illustrating the differences in the various forms. There are also eight colony brooders of five different makes by means of which the student can see the operation of the various kinds.

Shopwork.—The wood shop is equipped with thirty-three benches and complete sets of tools for 160 students. Each bench is equipped with modern vises. Other equipment

consists of a universal pattern maker's saw, board-planer, buzz-planer, band saw, speed-lathes and a large pattern maker's lathe with boring attachment.

The equipment of the machine shop consists of engine lathes, speed-lathe, vertical drill, planer, large universal milling machine, plain milling machine, shaper, power hack saw, tool grinder, twelve benches with vises and bench lathes and a large number of small tools, including micrometers, calipers and gages necessary for accurate work.

In the forge shop are seventeen Sturtevant down-draft forges with anvils and necessary tools. The blast to the forges is furnished by a No. 4 blower, and the smoke is carried away by a 60-inch exhauster. These are driven by a small steam-engine.

All the shops are operated by 550-volt three-phase induction motors, suitably connected to line shafting, and driving the tools by the "group plan."

Zoölogy.—The college is favorably situated geographically for the study of zoölogy. Within a few minutes' walk of the laboratory, the Oyster river meets the tide water from Great Bay. This furnishes a graduation of salt, brackish and fresh water with an abundance of their characteristic fauna. Great Bay, the Piscataqua river and the open ocean are within easy access, and have their own peculiar, characteristic forms. On the other hand, there are numerous bodies of fresh water, with typical fresh water forms.

The department of zoölogy is prepared to offer courses in the following subjects: (A) systematic zoölogy; (B) physiology and sanitation; (C) philosophical zoölogy; (D) anatomical zoölogy.

The equipment for the work in systematic zoölogy consists of a well-lighted laboratory, provided with tables, charts, dissecting and compound microscopes. All of the latest books and periodicals on systematic zoölogy are at the student's disposal. The lecture room is fitted with a new reflectoscope capable of projecting opaque objects, text-

book figures or lantern slides. The room has a seating capacity of eighty, and is provided with tablet armed chairs which enable the students to readily take down notes and drawing. There is a fairly complete collection of local invertebrates, and a very good collection of the birds of New Hampshire. The work in systematic entomology is greatly aided by a large and complete collection of insects which is the property of the experiment station.

The proximity to both salt and fresh water renders the work in advanced systematic zoölogy unusually attractive. In addition to the regular collecting equipment, nets, aquaria, etc., advanced students also have the use of row-boats and a gasolene launch.

In the work in physiology, hygiene and sanitation, the department is provided with an unusually fine collection of injected preparations of the human body, and with numerous charts. The same laboratory and equipment is used in this work as noted above.

For work in evolution and experimental zoölogy the department has a very complete library. Studies in ecology in Great Bay and vicinity are encouraged, for which purpose the students have the use of a camera equipment. In addition to the study of evolution under natural conditions the department also furnishes aquaria for laboratory study and experiments.

The work in anatomical zoölogy is greatly facilitated by an abundance of fresh material which may be collected as needed. For the study of human and comparative anatomy a full set of skeletons and preserved material is provided. Students interested in histology have access to a private collection of some two thousand microscope slides.

Museum.—The museum had for a nucleus the collection made during the state geological survey. To this, additions have been made from various sources. Specimens are being collected to illustrate the zoölogy of New Hampshire, and New Hampshire collectors and naturalists are invited to make the museum the permanent depository of their collections.

GENERAL INFORMATION

COURSES

The college is a part of the public school system of the state, continuing the work of the high school, and it is open to both men and women. In accord with the origin and function of the college, its courses are essentially practical, leading directly to the student's preparation for a successful livelihood.

I. Agricultural Division.

a. Four-Year Courses.

1. Animal Husbandry and Dairying.
2. Forestry.
3. Horticulture.
4. Teacher-Training Course in Agriculture.

b. Two-Year Course in Agriculture.

c. Farmers' One-Week Course.

II. Arts and Science Division.

a. Four-Year Courses.

1. General Arts and Science.
2. Home Economics.
3. Mechanic Arts for Teachers.
4. Arts Course in Chemistry.

III. Engineering Division.

a. Four-Year Courses.

1. Chemical Engineering.
2. Electrical Engineering.
3. Mechanical Engineering.
4. Architectural, Electrical and Mechanical Construction.

EXPENSES

ESTIMATE OF FRESHMEN EXPENSES

	High	Average	Low
Tuition	$60.00	.....	.....
Fees	30.00	$30.00	$30.00
Books	20.00	18.00	16.00
Room	90.00	70.00	40.00
Table Board	210.00	175.00	120.00
Laundry	15.00	12.00	4.00
Uniform*	.....	.....	.....
Incidentals	50.00	20.00	10.00
Total	$475.00	$325.00	$220.00

Tuition and Fees.—Tuition is $60 a year; incidental fees are $30 a year. They are payable in advance in three equal installments, one on the first day of each term. A diploma fee of $5 is charged upon graduation. Charges will be assessed for extraordinary breakage or damage. No laboratory or course fees are charged. Payment of the incidental fees entitles the student to admission to all athletic games and contests.

Books.—Students may purchase at cost all books, drawing instruments, materials, etc., at the college bookstore in Thompson Hall.

Rooms.—The college has two dormitories for women and one for men. All rooms are heated, lighted and furnished. Bed linen, quilts and towels, however, are provided by the individual students. Each woman's dormitory is equipped with a laundry. In most cases, two students occupy a room or suite of rooms. Prices range from $60 to $84 a year for each student. Applications for rooms in the dormitories should be made directly to Mr. O. V. Henderson, business secretary of the college. Early application is necessary in order to secure a choice of rooms. Rooms in private families may be secured for about

*Uniform for members of the Reserve Officers' Training Corps is provided by the federal government.

Expenses for travel, clothing, etc., vary with the individual student.

the same prices as for those in dormitories. Less desirable, but comfortable, rooms may be obtained by men in several private dormitories at a somewhat less figure.

Women students, unless living at home, are required to room in one of the women's dormitories, or in approved houses.

Board.—The new Commons Building will provide boarding facilities commencing September, 1919. It is expected that its complete equipment will enable the college to offer substantial board at a minimum price.

COLLEGE AIDS TO STUDENTS

Scholarships.—Scholarships are awarded annually for the purpose of aiding deserving students. Recently, the large increase in student attendance has utilized to the full all scholarships thus far provided. However, the trustees are anxious to supply scholarships to all really needy young men and women in New Hampshire. In order to do this, they necessarily require full information of all applicants in order that the benefits may be awarded most equitably.

These scholarships will be forfeited at any time for misconduct, or for the use of intoxicating liquor or tobacco. They will also be withdrawn from students in all four-year courses who fail to secure an average grade of sixty in any one semester, and, only in cases of special financial necessity, will they be restored by the president.

Conant Scholarships.—There are twenty-seven Conant scholarships, each paying tuition, $60; fees, $30; cash, $10,—total, $100. These are assigned under the following conditions:

They are to be given to young men taking agricultural courses.

Each town in Cheshire County is entitled to one scholarship, and Jaffrey is entitled to two.

They will be reserved for their respective towns until August 1 of each year. Those not taken by students from

Cheshire County, and those in excess of the number of towns, will then be assigned to agricultural students from other parts of the state, and may be divided at the discretion of the president. These scholarships are assigned annually and are good for one year only.

Senatorial Scholarships.—There are twenty-four senatorial scholarships, one for each senatorial district. They are at the disposal of the senators from these districts. These scholarships are to be assigned each year and are good for one year only. Each one pays the tuition of $60. The method of appointment is entirely at the option of the senator concerned and may be by election, competitive examination, or otherwise. It is hoped, however, that preference will be given to needy applicants. These scholarships are open to students in all courses, but are restricted to residents of the state.

Grange Scholarships.—In order to equalize to some extent the distribution of scholarships throughout the state, a scholarship paying tuition of $60 has been placed at the disposal of each subordinate and Pomona Grange in New Hampshire, for the use of a four-year or two-year student. These scholarships are to be assigned each year and are good for one year only. The method of appointment is entirely at the option of the grange; it may be by election, competitive examination, or otherwise. It is hoped, however, that preference will be given to needy applicants. Holders of these scholarships need not be members of the grange, but must be resident within the state.

Valentine Smith Scholarships.—Through the generosity of the late Mr. Hamilton Smith of Durham, the sum of $10,000 has been given to establish the Valentine Smith scholarships.

"The income thus accruing to the college shall be given to the graduate of an approved high school or academy who shall, upon examination, be judged to have the most thorough preparation for admission."

These scholarships yield $100 annually and will be for-

feited if an average rank of 75 per cent. is not maintained for each term.

Competitive examinations for this scholarship will be held June 26 and 27 in Durham, Keene, Laconia, Lancaster, Manchester and West Lebanon. Contestants must present credentials fulfilling the requirements for entrance to the college and must pass examinations in English, American history, algebra through quadratics, plane geometry and either physics or chemistry.

Requests for examinations should be forwarded to the Dean of the College at least one week before the beginning of the examination period, and must state the names and addresses of the students, the places at which they will present themselves, and the examinations desired.

Examinations are not restricted to residents of the state.

State Scholarships.—By an annual scholarship appropriation of $3,000, the state provides free tuition for fifty New Hampshire students. These scholarships are awarded annually strictly on the basis of financial need, and are good for one year only. Applicants must furnish full information in relation to their own financial status and that of their parents.

Prizes.—*Bailey Prize.*—Dr. C. H. Bailey of Gardner, Mass., and E. A. Bailey, B.S., of Keene, N. H., offer a prize of ten dollars for proficiency in chemistry.

Erskine Mason Memorial Prize.—Mrs. Erskine Mason of Stamford, Conn., has invested one hundred dollars as a memorial to her son, a member of the class of 1893, the income of which is to be given, for the present, to that member of the senior class who has made the greatest improvement during his course.

Chase-Davis Memorial Medals.—In the spring of 1909 the Glee Club voted to present a gold and a silver medal yearly to the college in memory of Carl Chase, '09, of Webster, an enthusiastic member of the New Hampshire football team and the Glee Club, and of John Worthen Davis, '11, of Concord, who were drowned in Great Bay, December 7, 1908.

According to the terms of this gift, the gold medal is to be awarded to the senior who has won an "N. H." and stands highest in his studies, and the silver medal is to be awarded to the senior who has won an "N. H." and stands second in his studies. These medals are for excellence in athletic competition primarily, and the number of times a man wins an "N. H.," during his college career shall be of importance in making the award.

Chi Omega Prize.—The Chi Omega Sorority of New Hampshire College offers a prize of ten dollars for the best thesis on a sociological subject written by a woman student in Sociology 52, 54, or 58.

Lillian S. Edwards Prize.—A fund has been provided by Mrs. Lillian S. Edwards of Sanbornville for the publishing and distribution of the best thesis on a sociological subject written by a student for the Department of Sociology during the second term of the college year.

Self-Support.—Students obtain considerable financial aid by janitorships, by table work at boarding clubs, and by work on the farm and in the greenhouse. They also find employment with the power and service department of the college and with the experiment station. However, so much depends upon the individuality of the student that the college can guarantee nothing in any particular case, but is glad to assist by informing students of opportunities for work.

STUDENT REGULATIONS

The following are a few of the student regulations that should be carefully noted. Students are held accountable for all student regulations.

Physical Examination.—A physical examination must be passed by all students before registration.

Registration.—Undergraduate students are required to register before 4 p. m. of the first day of each term. Those desiring to register by mail or in person preceding registration day, should write the registrar for registration

blanks, which, when filled out, should be forwarded to the business secretary, together with the student's remittance for his term's tuition, and fees.

Any former student who registers after the first day of a term will be charged for such registration a fine of one dollar for the first day and fifty cents additional for each succeeding day, to be remitted only by the president upon presentation by the student of a substantial excuse for delay.

Election of Studies.—Every student shall, on or before the Saturday before the last in each term, notify the registrar, in writing, of his election for the term following. Any student who fails to fill out his elective slip on or before the date mentioned shall pay a fine of one dollar before he can be registered for the studies of the next term, unless he has previously obtained from the president a written excuse for delay.

Every student is responsible for all work assigned him on his registration card, and no credit will be given for any subject unless the student is registered for the same.

Changes in Schedule.—A student may add or drop an elective subject only upon the approval of his faculty adviser during the period intervening between the day he registers and 6 p. m. of the fifth day following. A student, in making changes in his elective slip shall have them approved (on a "drop and add card") by his faculty adviser, and said card must be filed with the registrar. After the fifth day following his registration, no changes can be made by a student without the consent of his division committee.

Substitutions.—A substitution for a required subject may be permitted only for special reasons, and then only upon consideration by the department concerned and the proper division committee, and with the approval of the faculty.

Convocation.—Every student is expected to attend Convocation and all class exercises in the subjects for which he is registered and will be held responsible for all the work given in these subjects.

Vacations.—A student absent from a class exercise immediately preceding or following a scheduled holiday or vacaton period shall be subject to a fine of $5 unless permission for the absence has been previously granted by the proper division committee.

Warnings.—Any student who receives official warning that he is below sixty in one or more subjects which represents more than seven credit hours per week or who has accumulated deficiencies in more than eight credit hours shall not participate in class or college athletic contests, be manager of any team or represent the college in any other public capacity. A warning in a subject shall hold until the mark for that subject is in the hands of the registrar.

Grades.—Sixty is the passing grade of the college. Any mark below sixty shall be called a "deficiency." "Deferred" denotes that work is incomplete on account of illness or on account of an excuse which has received the approval of the faculty, and that it will be graded later. Every condition and every deferred mark shall lapse into a failure if it is not made up before the end of the following term.

METHODS OF ADMISSION

New Hampshire College will admit without examination all candidates for admission who are graduates of high schools or academies of New Hampshire that are approved by the State Department of Public Instruction, provided the division entrance requirements of the college are met.

Graduates of schools specially approved by the college will be admitted on the same terms as graduates of approved schools in New Hampshire.

Graduates of other high schools and academies will be admitted on passing examinations in fifteen units. However, the college can not agree to give examinations in certain vocational subjects involving mainly practical work. Instead, it may require special certification in such subjects.

Cases not covered by the above statements will be decided by the entrance committee of the faculty.

Candidates for advanced standing are admitted on the basis of the work completed at the institutions from which they come.

DIVISION UNIT REQUIREMENTS

There are three divisions of New Hampshire College; the Agricultural, the Arts and Science, and the Engineering. These divisions are defined and described elsewhere in this announcement.

An entrance unit represents one study of four or five recitations a week for one year. It is assumed that two hours of manual training or laboratory work are equivalent to one hour of classroom work.

Candidates for admission to the freshman class of the various divisions of the college must show evidence, either by credentials or by examination, that they are prepared in fifteen units as indicated in the following table:—

FOUR-YEAR COURSES

Required Units	Agricultural Division.	Arts and Science Division.	Engineering Division.
Group A English,	3	3	3
**Group B* Mathematics,	2	2	3
Group C Social Science and History,	1	1	1
Group D Natural Science,	1	1	1
	7	7	8
Elective Units	8	8	7
Total for admission,	15	15	15

Group E Foreign languages, ancient or modern.
Group F Vocational subjects: agriculture, commercial subjects, domestic arts, mechanic arts.
Elective units may be offered from groups A, B, C, D, E. and F.

The credentials to be rendered by principals must state the time of graduation, the subjects studied, the number of entrance units in each, the grades attained by the student and the passing grade of the school.

The credential forms to be used will be furnished by the college on application to the registrar.

Entrance by Examination.—Examinations will be given at the college at the time of opening in September. They will also be given in connection with the Valentine Smith examinations in June. Requests for these examinations should be forwarded to the Dean of the College at least one week in advance.

*A candidate for admission to the Arts and Science Division of New Hampshire College who offers two units in a foreign language may substitute for the two units required in Mathametics two additional units in subjects named in groups C, D and E above.

Candidates for admission to the Construction Courses of the Engineering Division may be admitted with two units of mathematics, provided a total of 15 units is offered.

ENTRANCE REQUIREMENTS

GROUP A. ENGLISH

The examination paper in English will be based upon the principle that the way to learn to write is to read.

All candidates will therefore be required to write a series of short themes which will show an adequate knowledge and thorough appreciation of certain great English classics as literature—as "the life blood of the mind." The classics selected are as follows: Shakespeare's Merchant of Venice, Henry V, and Macbeth; one novel each by Scott, Dickens, George Eliot, Stevenson, Cooper and Hawthorne; one essay each by Macaulay, Ruskin and Lowell; the subject-matter and nature of the poetry of Wordsworth, Byron, Tennyson, Longfellow and Whittier.

As a special test in spelling, grammar, punctuation and paragraphing, the candidate will be required to write a short theme upon some subject pertaining to the home or school life of the average high school senior.

An optional question will be offered for the purpose of discovering the candidate's familiarity with the best modern periodical literature.

GROUP B. MATHEMATICS

1. **Elementary Algebra.**—The four fundamental operations for rational algebraic expressions. Factoring, determination of highest common factor and least common multiple by factoring. Fractions, including complex fractions, and ratio and proportion. Linear and quadratic equations, both numerical and literal. Problems depending on linear and quadratic equations. Radicals, including the extraction of the square root of polynomials and of numbers. Exponents, including the fractional and negative.

2. **Advanced Algebra.**—The formula for the *n*th term and the sum of the terms of arithmetical and geometrical progressions, with applications. The theory and use of logarithms, without involving the use of infinite series. The binomial theorem for positive integral exponents.

Complex numbers, with graphical representation of sums and differences. Determinants limited to simple cases. The elements of the theory of equations.

3. **Plane Geometry.**—The usual theorems and constructions of good text books, including the general properties of plane rectilineal figures; the circle and measurement of angles; similar polygons; areas; regular polygons, and the measurement of the circle. The solution of numerous original exercises, including loci problems. Applications to the measurement of lines and plane surfaces.

4. **Solid Geometry.**—The usual theorems and constructions of good text books, including the relations of lines and planes in space; the properties and measurement of prisms, pyramids, cylinders and cones; the sphere and the spherical triangle. The solution of numerous original exercises, including loci problems. Applications to the measurement of surfaces and solids.

5. **Plane Trigonometry.**—The subject-matter of plane trigonometry as presented in good text books, including the solution and use of trigonometric equations of a simple character, the use of logarithms, the solution of right and oblique triangles, and practical applications.

6. **Review Mathematics.**—A general mathematics review during half of senior year is recommended, especially for students preparing for college engineering courses. A certificate covering the work of not more than one unit will be accepted for entrance. No examinations will be given.

GROUP C. SOCIAL SCIENCE AND HISTORY

This group includes history, political economy, and commercial law.

Although there are excellent text books in history, an adequate preparation cannot be obtained by textbook work alone. Some collateral work is necessary, whatever textbook is used, and with certain text books a large amount is necessary. The details of the preparatory work in history are

fully stated in "A History Syllabus for Secondary Schools," by the New England History Teachers' Association. Boston, D. C. Heath & Co., 1904. Details are also stated in "Standard Program for the Secondary Schools of New Hampshire, Department of Public Instruction, Concord, N. H."

1. **Ancient History.**—This may include the earliest nations and the period to 800 A. D., or it may be limited to Grecian History and Roman History to the fall of the Western Roman Empire.

2. **Mediaeval and Modern History.**

3. **English History.**

4. **American History and Civics.**—The work may conform to the course in American constitutional history described in the "Standard Program" or to the course in American history developed in nearly a hundred pages of the "Syllabus." It is assumed that in any case a reasonable amount of time is to be given to the study of the Constitution of the United States.

5. **Political Economy.**—(1) The study of a standard text. (2) At least six topics investigated by outside reading.

6. **Commercial Law.**—(1) Study of a standard text. (2) The study of a total of not less than thirty-six specific cases.

GROUP D. NATURAL SCIENCE

A notebook, carefully kept and examined by the teacher, is an essential part of all laboratory work in science.

1. **Botany.**—The work in botany should consist of (1) the study of a standard text; (2) four or five exercises per week, at least one of which should be laboratory work. Either a half or the whole of a year's work will be accepted.

2. **Chemistry.**—Elementary inorganic chemistry; should cover the more common nonmetallic and metallic elements with their most important compounds, together with an introduction to the general theoretical principles; calcula-

tions based upon changes of gaseous volumes and chemical equations. A year's work should consist of four or five exercises per week, at least one of which should be laboratory work.

3. **Physics.**—The standard work in physics should consist of (1) the study of a standard text; (2) not less than forty experiments worked out in the laboratory by each student and properly recorded in a suitable notebook.

4. **Zoölogy.**—A study of the fundamental principles of animal structure and the dissection of type forms. The student should become familiar with the characteristics of the various phyla of the animal kingdom. The study should consist of four or five exercises a week, at least one of which should be laboratory work. Either a half or the whole of a year's work will be accepted.

5. **General Science.**—To meet a recent movement in the disposition of the science work in the high schools, a course in general science which amounts to at least four exercises a week for one year will be accepted. Such a course may include something of the biologic and earth sciences, the sciences employed in household economy, and the more common phenomena of physics and chemistry.

GROUP E. FOREIGN LANGUAGES

1. **French.**—Work of the first year should include (1) careful drill in pronunciation, (2) drill upon the rudiments of grammar, (3) abundant translation of simple English prose into idiomatic French, (4) reading of from 100 to 175 pages of French prose, (5) writing French from dictation. Work of the second year should include (1) the reading of from 250 to 400 pages of easy modern prose, (2) constant practice in translating from English into French variations of the text read, (3) frequent paraphrases of the text read, (4) dictation.

2. **German.**—Work of the first year should include (1) careful drill in pronunciation, (2) drill upon the rudiments

of grammar, such as the inflection of the articles, the common nouns, adjectives, pronouns and strong and weak verbs; upon the uses of the prepositions, the modal auxiliaries, and the rules of syntax and word order, (3) writing from dictation, (4) the reading of from 75 to 100 pages of prose, (5) translation from English into German. Work of the second year should include (1) the reading of from 150 to 200 pages of prose, (2) constant practice in translating from English into German variations of the text read, (3) dictation, (4) continued drill upon the rudiments of grammar, (5) frequent paraphrases of the text read.

3. **Latin, Elementary.**—Grammar and four books of Caesar. Two years' work.

4. **Latin, Advanced.**—Virgil, six books. Cicero, six orations.

GROUP F. VOCATIONAL SUBJECTS

1. Agriculture

Agronomy.—A textbook or lecture and recitation subject upon the formation, classification, composition, physical properties and tillage of soils; the kinds, use, value, and function of different chemical fertilizers; the use, composition, and preservation of farm manures; the planting, cultivating, harvesting, use, and marketing of the different kinds of field crops. The textbook and lecture work should be supplemented by field and laboratory exercises. Four or five periods per week for one year.

Animal Husbandry and Dairying.—A textbook and recitation subject upon the types and breeds of horses, cattle, sheep, swine, and poultry with practical exercises in stock judging; a study of the principles of feeding, the classification of animal foods, with practice in computing and mixing rations. Also a subject upon the composition, properties, care and handling of milk, with practical exercises in testing milk, cream, and butter with the Babcock test. Four or five exercises per week for one year.

Horticulture.—A textbook or lecture and recitation sub-

ject upon the classes and varieties of fruits; the location and fertilization of orchards; the pruning, grafting, and spraying of fruit trees, with some study of fungous and insect pests. Practical exercises in picking, packing, and marketing of fruit. Also a study in vegetable growing, in which each student learns the classes, varieties, uses, and adaptations of our most important vegetables. Practical gardening work in growing vegetables. Four or five exercises per week for one year.

Rural Economics and Farm Management.—A textbook, lecture and recitation subject upon the economic relations of land, labor, and capital. A detailed study of the cost of producing and marketing farm and garden crops. Also a study of the business end of farming, buying and selling methods, types of farming, systems of rotation, the keeping of farm accounts, and the making of inventories. Four exercises per week for one year.

2. **Commercial Subjects.**—Bookkeeping, commercial arithmetic, commercial geography, stenography, and typewriting.

3. **Domestic Arts.**—Foods and cookery, dressmaking, household sanitation and mechanical appliances, household economics, household design and decoration.

4. **Mechanic Arts.**—Casting, drawing, forging, machine work, molding, pattern-making, woodwork.

SPECIAL COURSES

Persons of mature years presenting satisfactory evidence of their ability to complete any desired course of study may be admitted by vote of the faculty as special students.

REQUIREMENTS FOR DEGREES

ADVANCED DEGREES

Advanced degrees may be conferred upon candidates who have received the degree of B.S. from this college or from any institution of like standing upon the fulfilment of the following requirements:

Degree of M.S.—The successful completion of a course of graduate study pursued in residence and approved by the faculty of the college.

The preparation of an original thesis satisfactory to the faculty of the college.

Degree of M.E.—Professional experience of at least four years.

The successful completion of a course of graduate study approved by the Engineering Division Committee.

The preparation of an original thesis satisfactory to the faculty of the college upon some subject approved by the Engineering Division Committee.

For details concerning the regulations governing the conferring of degrees address Dean C. H. Pettee.

UNDERGRADUATE DEGREES

The college confers two undergraduate degrees: Bachelor of Science and Bachelor of Arts.

The degree of Bachelor of Science is conferred upon students graduating from the Agricultural Division, from the Engineering Division, and upon students graduating from the Arts and Science Division who have elected the Home Economics Course, the Arts Course in Chemistry, the Mechanic Arts Course for teachers, or who have majored in groups 2 or 3 of the General Arts and Science Course. The degree of Bachelor of Arts is conferred upon students graduating from the General Arts and Science Course who have majored in group 1.

Agricultural Division

The completion of 216 term hours.

The completion of the studies required in one of the following courses:

(a) Animal Husbandry and Dairy Husbandry.
(b) Forestry.
(c) Horticulture.
(d) Teacher Training Course in Agriculture.

Students graduating from the four-year courses in agriculture must present to the dean of the division on or before the second Tuesday preceding commencement satisfactory evidence of having had practical experience in farm work, either through having lived on a farm for at least two years subsequent to the age of 12, or through having worked on a farm for at least six months subsequent to the age of 16.

Students graduating from the Forestry Course must have spent at least three months in practical forest work, which time will be counted as a part of the six months' requirement.

Arts and Science Division

(a) General Arts and Science

1. The completion of 204 term hours, of which a minimum of 18 shall be required each term of the freshman and sophomore years, and a minimum of 16 hours each term thereafter.

2. The completion of English 1–a, 2–b, 3–c.

3. The completion of the military and physical culture requirements or their equivalent.

4. The completion of major and minor requirements as follows.

The Arts and Science courses are divided into three groups:

Group I.—Language, Literature and History: English, French, German, Latin, Spanish, History.

Group II.—Mathematics and Natural Science: Agricultural subjects,* Botany, Chemistry, Drawing, Geology, Home Economics, Mathematics, Meteorology, Physics, Zoölogy.

Group III.—Social Science: Economics, Education, Political Science, Psychology, Sociology.

Group Requirements

Each Arts and Science student shall elect at least 27 term hours in each of the above three groups.

Major Requirements

Each Arts and Science student shall, at the beginning of the third term of his second year, select a department to be known as his major department.

In this major department he shall complete 27 term hours in which he shall make a grade of 70 or better.

In case of departments in which less work is offered than the amount required for the major, the shortage may be made up from such other related departments as the head of his major department may prescribe.

Minor Requirements

Each student shall, with the approval of the head of his major department, elect, for a minor, 27 term hours of subjects related to his major.

Student Advisers

1. For Freshmen and First and Second Term Sophomores:

A committee of faculty members shall be appointed by the dean of the Arts and Science Division to act as advisers for freshmen and first and second term sophomores, and the elective slip of each student must be approved by a member of this committee.

2. For Third Term Sophomores, and for Juniors, and Seniors:

* Agricultural subjects as part of minor only.

A student shall have for his adviser the head of his major department; provided, that in case a student majors in a department outside the Arts and Science Division, his elective slip shall also be approved by the dean of the Arts and Science Division.

(b) Home Economics

The completion of 204 term hours.

The completion of the subjects required in the Home Economics branch.

(c) Mechanic Arts for Teachers

The completion of 216 term hours.

The completion of the subjects required in the Mechanic Arts Course for Teachers.

Students desiring to be accredited to teach industrial education in Smith-Hughes schools should take the regular work as prescribed in the Mechanic Arts Course for Teachers, except that the required work of the third term of the senior year should be taken during the third term of the junior year. Also, the student should work in the shops during two summers of his college career.

(d) Arts Course in Chemistry

The completion of 207 term hours.

The completion of the subjects required in the Arts Course in Chemistry.

Engineering Division

The completion of 216 term hours.

The completion of the studies in one of the following branches:

(a) Chemical Engineering.
(b) Electrical Engineering.
(c) Mechanical Engineering.
(d) Architectural, Electrical and Mechanical Construction Courses.

THESES

The preparation of a thesis upon some subject connected with the work of the division may be required by the division committee of candidates for a degree.

The subject of a thesis, together with a written approval by the head of the department concerned, must be filed with the registrar within one week of the opening of the second term. The thesis is to be submitted to the head of the department not later than the second Tuesday preceding commencement day.

It is to be typewritten or printed upon standard thesis paper, eight and one-half by eleven inches, medium weight, and must be neatly bound in black cloth and gilt-lettered on the first cover with title, name of author, degree sought, and year of graduation. This bound copy is to be filed and left with the college librarian before commencement day.

FOUR-YEAR COURSES

AGRICULTURAL DIVISION

FREDERICK W. TAYLOR, *Dean*

The courses of this division are designed for the general education and scientific training of students in the various economic branches of agriculture. The lecture and recitation work of the classroom is supplemented largely by practical exercises in the laboratories. Seminar studies are also given, especially for seniors and advanced students. During junior and senior years students may elect certain courses of study which will enable them to specialize in animal husbandry, dairy-husbandry, horticulture, or forestry. They may also specialize in preparation for teaching agriculture.

While the two-year course is intended to give the student as thorough training in the science and practical details of farm operations as the time will allow, it does not give that opportunity for a broad general foundation of pure and applied science which the four-year courses afford; the latter courses aim primarily to combine a college education with that of a technical vocation. Many of the graduates of the four-year courses return to the farm for the purpose of putting into practice the knowledge and training of their college work, and many of them are becoming successful and prosperous citizens of the community; others who have no farms of their own accept salaried positions as superintendents or foremen on the dairy, fruit or truck farms of large owners; still others take positions as teachers of science and agriculture in our secondary schools or as assistants in our agricultural colleges and experiment stations.

The Agricultural Division offers the following four-year courses of study:

Animal Husbandry and Dairy Husbandry Course.—This course is designed for those students who wish to specialize

either in animal husbandry or dairy husbandry. Election of subjects between these two departments may be made throughout the junior and senior years. The dairy building with its complete modern equipment, and the additional subjects and increased facilities for instruction in the animal husbandry department, make this course especially attractive.

Forestry Course.—The forestry course offers to students who have entered the agricultural division an opportunity to specialize in forestry during the junior and senior years. This arrangement allows the student to devote a large amount of time to the various branches of forestry, but at the same time requires a foundation in agriculture and in the sciences upon which agriculture is based. The college forest of sixty acres of old-growth pine and hemlock, and other areas of natural and planted growth, furnish the laboratory for the forestry student. Ample opportunity is given to study the various forest problems on the ground as well as in the classroom.

Horticultural Course.—This course is designed for those students who contemplate making a specialty of some branch of horticultural work. Several advanced subjects in botany will be required, but during the senior year opportunity will be given to elect subjects in other departments. The horticultural department is well equipped with gardens, orchards, greenhouses and laboratories for the study of the different phases of this industry, especially fruit growing, which is so prominent in the agriculture of the state.

Teacher Training Course in Agriculture.—Under the provisions of the Smith-Hughes act New Hampshire College has been designated as the institution in this state for the training of teachers of agriculture. The course of study provided for this purpose requires that at least 40 per cent of the work consist of technical agricultural subjects, 20 per cent of subjects in related sciences, and 10 per cent of educational subjects, including special methods and four to six weeks of practice teaching in secondary schools. Stu-

dents who have completed the prescribed course of study will be accredited as qualifying under the Smith-Hughes act, provided that in addition they have had:

(a) farm up-bringing prior to such course, or
(b) two years' agricultural experience, one of which is in a recognized agricultural enterprise on a commercial scale.

The rapidly increasing demand for teachers of agriculture in our secondary schools has indicated the necessity of training men especially for this important line of work, and the teacher training course is designed to meet the need.

AGRICULTURE

ALL COURSES

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Breeds of Live Stock (A. H. 1–a)	4		
Survey of Agriculture (Agric. 1–b)		1	
General Botany (Bot. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 1–a, 2–b, 3–c)	3	3	3
Qualitative Analysis (Chem. 5–c)			3
General Zoölogy (Zoöl. 30–a, 31–b)	3	3	
Systematic Zoölogy (Zoöl. 32–c)			3
Trigonometry (Math. 21–b)		3	
Military Art (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
Physical Education	½	½	½
	18	18	17

Sophomore Year

Farm Dairying (D. H. 1–b)		4	
Farm Poultry (P. H. 1–b,* 2–c)		3	3
Vegetable Gardening (Hort. 1–c)			3
Practical Pomology (Hort. 3–c)			3
Economic Entomology (Ento. 1–a)	4		
Principles of Forestry (For. 1–a)	4		
Agricultural Engineering (Agron. 1–a)	4		
Quantitative Analysis (Chem. 13–a, 14–b)	2	2	
Physics (Phys. 1–a, 2–b)	3	3	
Agricultural Drawing (Draw. 10–c)			3
Forging (Shop 4–b)		3	
Woodwork (Shop 20–c)			2
Military Art (M. A. 4–a, 5–b, 6–c)	1½	1½	1½
Physical Education	½	½	½
Elective			3
	19	17	19

* Elective for students intending to take Forestry course.

ANIMAL HUSBANDRY AND DAIRY HUSBANDRY COURSE

Junior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Field Crops (Agron. 2–a, 3–b)	3	3	
Soils (Agron. 4–c)			4
Anatomy (A. H. 4–a) *or* *Milk Production* (D. H. 3–a)	4		
Infectious Diseases (A. H. 5–b) *or* *Ice Cream and Cheesemaking* (D. H. 6–b)		4	
Non-Infectious Diseases (A. H. 6–c) *or* *Butter Making* (D. A. 7–c)			4
Feeds and Feeding (A. H. 3–c)			4
Market Milk (D. H. 5–b)		4	
Bacteriology (Bot. 9–a, 10–b, 11–c)	3	3	3
Elementary Geology (Geol. 1–a)	4		
Elective	4	4	3
	18	18	18

Senior Year

Farm Management (Agron. 8–a)	4		
Fertilizers (Agron. 5–b)		3	
Soil Fertilization (Agron. 6–c)			3
Animal Breeding (A. H. 7–a)	4		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Agricultural Economics (Econ. 8–c)			3
Meteorology (Met. 1–b)		3	
Elective	7	9	12
	18	18	18

FORESTRY COURSE

Junior Year

Soils (Agron. 4–c)			4
Landscape Gardening (Hort. 7–c)			4
Plant Histology (Bot. 6–a, 7–b)	2	2	
Bacteriology (Bot. 8–a)	3		
Plant Physiology (Bot. 4–b, 5–c)		3	3
Dendrology (For. 2–a)	4		
Silviculture (For. 3–a, 4–b, 5–c)	3	3	3
Forest Mensuration (For. 6–b)		4	
Elementary Geology (Geol. 1–a)	4		
Elective	2	6	4
	18	18	18

FOUR-YEAR COURSES

Senior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Plant Pathology (Bot. 12–a, 13–b)	3	2	
Forest Protection (For. 9–a)	3		
Forest Management (For. 7–b, 8–c)		3	3
Forest Practice (For. 14–b)		4	
Forest Utilization (For. 13–a)	3		
Meteorology (Met. 1–b)		3	
Surveying (Math. 22–a)	3		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Agricultural Economics (Econ. 8–c)			3
Elective	3	3	12
	18	18	18

HORTICULTURAL COURSE

Junior Year

Greenhouse Management (Hort. 2–a)	3		
Small Fruits (Hort. 4–b)		3	
Landscape Gardening (Hort. 7–c)			4
Nursery Management (Hort. 8–c)			4
Floriculture (Hort. 9–b)		3	
Vegetable Forcing (Hort. 11–b)		3	
Bacteriology (Bot. 8–a)	3		
Plant Physiology (Bot. 4–b, 5–c)		3	3
Field Crops (Agron. 2–a, 3–b)	3	3	
Soils (Agron. 4–c)			4
Elementary Geology (Geol. 1–a)	4		
Elective	5	3	3
	18	18	18

Senior Year

Systematic Pomology (Hort. 5–a, 6–b)	3	3	
Evol. and Improv. of Plants (Hort. 10–c)			3
Horticultural Seminar (Hort. 12–c)			1
Plant Pathology (Bot. 12–a, 13–b)	3	2	
Farm Management (Agron. 8–a)	4		
Fertilizers (Agron. 5–b)		3	
Soil Fertilization (Agron. 6–c)			3
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Agricultural Economics (Econ. 8–c)			3
Surveying (Math. 22–a)	3		
Meteorology (Met. 1–b)		3	
Elective	2	4	8
	18	18	18

NEW HAMPSHIRE COLLEGE

TEACHER TRAINING COURSE

Junior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Field Crops (Agron. 2–a, 3–b)	3	3	
Soils (Agron. 4–c)			4
Farm Accounting (Agron. 7–c)			3
Anatomy (A. H. 4–a) *or* *Milk Production* (D. H. 2–a)	4		
Infectious Diseases (A. H. 5–b) *or* *Butter Making* (D. H. 3–b)		4	
Feeds and Feeding (A. H. 3–c)			4
Market Milk (D. H. 4–b)		4	
Poultry (P. H. 6–b)		3	
Incubation and Breeding (P. H. 7–c)			3
Bacteriology (Bot. 8–a)	3		
Elementary Geology (Geol. 1–a)	4		
Secondary Education (Educ. 10–b, 11–c)		2	3
General Psychology (Psych. 10–a)	3		
Elective	2	2	2
	19	18	19

Senior Year

Methods of Teaching (Agric. 2–a)	3		
Breeding (A. H. 7–a)	4		
Farm Management (Agron. 8–a)	4		
Fertilizers (Agron. 5–b)		3	
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Vocational Education (Educ. 20–a)	3		
School Hygiene (Educ. 28–c)			3
Adolescent Psychology (Psych. 24–b)		3	
Meteorology (Met. 1–b)		3	
Practice Teaching (Agric. 4–c)			12
Elective	2	6	
	19	18	15

ARTS AND SCIENCE DIVISION

ERNEST R. GROVES, *Dean*

In the Arts and Science Division the following courses are offered:

General Arts and Science Course.—This course provides a general college training which especially prepares for secondary school teaching, business or graduate study. By means of the group system of elective studies an opportunity is given the student to specialize in zoölogy, botany, chemistry, physics, drawing, agriculture, mathematics, modern languages, English, psychology, sociology, political science, economics, history, home economics, and education.

Home Economics Course.—The course in home economics furnishes instruction in the branches that especially serve the need of women students. The work is planned to meet the demands of the day for scientific training in home making, to fit students to enter fields of professional activity in educational and institutional lines of work, and to provide thorough training for those students who wish to elect home economics as either a major or a minor subject in the Arts and Science Course.

The technical work in household science is based upon the principles of physical, biological and social sciences. The subjects in foods, nutrition and dietetics require physics, chemistry and physiology; those in sanitation necessitate a knowledge of chemistry and bacteriology; home administration and the care and education of children demands a knowledge of the principles of human nutrition and dietetics, and of the principles of economics, psychology and sociology. The training in drawing, color, and design which is gained in the department of drawing is related to the work in costume design and house decoration.

Beginning with 1919–20 there will be offered four types of home economics courses:

(1) Teacher Training Course. This is to train students for meeting state requirements for teaching in the Smith-Hughes high schools.

(2) Instructional Course. This is to train students for positions as managers and assistants in public institutions, such as college dormitories, hospitals, tea rooms, cafeterias, etc.

(3) Dietitians Course. This course is to train students for the dietary work in hospitals or in the feeding of other institutional groups.

(4) A General Course. For those not majoring in Home Economics there are several elections offered in addition to subjects in the other three courses which may be elected.

Mechanic Arts Course for Teachers.—This course provides an opportunity for preparation for the teaching of mechanic arts and manual courses in secondary schools and institutions. It was designed to meet the increasing demand for graduates of the college qualified to teach manual and mechanic arts courses. Although much of the work of this course is necessarily prescribed in such subjects as drawing, mathematics, shop work, English, psychology and education, a reasonable opportunity is given the student to elect other subjects in the Arts and Science Division. At the present time the demand for graduates from this course for secondary teaching is greater than the college can satisfy.

The Arts Course in Chemistry.—This is a general course in chemistry, less technical in character than the chemical engineering course. It prepares for certain kinds of commercial chemistry, secondary science teaching, and affords a splendid basis for graduate work in medical schools. The considerable amount of electives permits the student to choose work in education if professional preparation for teaching is desired.

ARTS AND SCIENCE DIVISION

GENERAL ARTS AND SCIENCE COURSE

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
**Military Art* (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
**Physical Education* (50–a, 51–b, 52–c)	½	½	½
Electives	13	13	13
	18	18	18

Sophomore Year

†*Military Art* (M. A. 5–a, 6–b, 7–c)	1½	1½	1½
†*Physical Education* (53–a, 54–b, 55–c)	½	½	½
Electives	15	15	15
	17	17	17

Junior Year

Electives	17	17	17

Senior Year

Electives	16	16	16

* Physical Education 1–a, 2–b and 3–c, giving 1 credit, are required of women students instead of Military Art and Physical Education 50–a, 51–b and 52–c.

† Physical Education 4–a, 5–b, and 6–c, giving 1 credit, are required of women students instead of Military Art and Physical Education 53–a, 54–b, 55–c.

HOME ECONOMICS

Dietitian's Course

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 6–a, 7–b, 8–c)	3	3	3
**Physics* (Phys. 4–a, 5–b)	3	3	
Drawing (Draw. 20–a, 21–b, 22–c)	2	2	2
Home Economics Textiles (H. E. 3–c)			3
†*French or German*	3	3	3
Personal Hygiene (Phys. Ed. 13–a)	2		
Physical Education (Phys. Ed. 1–a, 2–b, 3–c)	1	1	1
Electives	2	2	3
	19	17	18

Sophomore Year

Foods and Principles of Cooking (H. E. 4–a, 5–b, 6–c)	4	4	4
Physiology (Zoöl. 33–a, 34–b)	3	3	
Hygiene and Sanitation (Zoöl. 35–c)			3
Organic Chemistry (Chem. 15–a, 16–b)	2	2	
Drawing (Draw. 23–a, 24–b, 25–c)	2	2	2
†*French or German*	3	3	3
Physical Education (Phys. Ed. 4–a, 5–b, 6–c)	1	1	1
Electives	3	3	5
	18	18	18

Junior Year

Bacteriology (Bot. 8–a)	3		
Household Chemistry (Chem. 23–a)	3		
Household Physics (Phys. 12–a)	3		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Physiological Chemistry (H. E. 14–b)		3	
Nutrition and Dietetics (H. E. 15–b, 16–c)		3	3
Advanced Cooking (H. E. 13–b)		3	
House Management (H. E. 20–c)			3
House Decoration (H. E. 19–c)			2
Physical Education (Phys. Ed. 7–a, 8–b, 9–c)	1	1	1
Electives	5	5	9
	18	18	18

Senior Year

Institutional Management (H. E. 24–a)	4		
Industrial Management (H. E. 25–b)		4	
Institutional Practice (H. E. 26–c)			12
Electives	11	11	
	15	15	12

* Not required of those students who offer Physics for entrance credit.

† Two years of either French or German. One year of each cannot be substituted.

FOUR-YEAR COURSES

Institutional Course

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 6–a, 7–b, 8–c)	3	3	3
**Physics* (Phys. 4–a, 5–b)	3	3	
Home Economics (H. E. 3–c)			3
Drawing (Draw. 20–a, 21–b, 22–c)	2	2	2
Physical Education (Phys. Ed. 1–a, 2–b, 3–c)	1	1	1
Personal Hygiene (Phys. Ed. 13–a)	2		
Electives	4	6	6
	18	18	18

Sophomore Year

English	2 or 3	2 or3	2 or 3
Physiology (Zoöl. 33–a, 34–b)	3	3	
Hygiene and Sanitation (Zoöl. 35–c)			3
Organic Chemistry (Chem. 15–a, 16–b)	2	2	
Foods and Principles of Cooking (H. E. 4–a, 5–b, 6–c)	4	4	4
Drawing (Draw. 23–a, 24–b, 25–c)	2	2	2
Physical Education (Phys. Ed. 4–a, 5–b, 6–c)	1	1	1
Electives	3 or 4	3 or 4	5 or 6
	18	18	18

Junior Year

Elementary Economics (Econ. 1–a, 2–b)	3	3	
Household Chemistry (Chem. 23–a)	3		
Household Physics (Phys. 12–a)	3		
Bacteriology (Bot. 8–a)	3		
Advanced Cooking (H. E. 13–b)		3	
Nutrition and Dietetics (H. E. 15–b, 16–c)		3	3
Home Management (H. E. 20–c)			3
House Decoration (H. E. 19–c)			2
Physical Education (Phys. Ed. 7–a, 8–b, 9–c)	1	1	1
Electives	5	8	9
	18	18	18

Senior Year

Institutional Management (H. E. 24–a)	4		
Industrial Management (N. E. 25–b)		4	
Institutional Practice (H. E. 26–c)			12
Electives	11	11	
	15	15	12

*Not required of those who offer Physics for entrance credit.

Teacher Training Course

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Drawing (Draw. 20–a, 21–b, 22–c)	2	2	2
Inorganic Chemistry (Chem. 6–a, 7–b, 8–c)	3	3	3
**Physics* (Phys. 4–a, 5–b)	3	3	
Elementary Clothing (H. E. 1–a, 2–b)	2	2	
Personal Hygiene (Phys. Ed. 13–a)	2		
Textiles (H. E. 3–c)			3
Physical Education (Phys. Ed. 1–a, 2–b, 3–c)	1	1	1
Electives	3	3	6
	19	17	18

Sophomore Year

Foods and Principles of Cooking (H. E. 4–a, 5–b, 6–c)	4	4	4
Elementary Dressmaking (H. E. 11–c)			3
Physiology (Zoöl. 33–a, 34–b)	3	3	
Hygiene and Sanitation (Zoöl. 35–c)			3
Drawing (Draw. 23–a, 24–b, 25–c)	2	2	2
Organic Chemistry (Chem. 15–a, 16–b)	2	2	
Household Physics (Phys. 12–a)	3		
Physical Education (Phys. Ed. 4–a, 5–b, 6–c)	1	1	1
Electives	3	6	5
	18	18	18

Junior Year

Bacteriology (Bot. 8–a)	3		
Household Chemistry (Chem. 23–a)	3		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
General Psychology (Psych. 10–a)	3		
Secondary Education (Ed. 10–b, 11–c)		2	3
Advanced Cooking (H. E. 13–b)		3	
Nutrition and Dietetics (H. E. 15–b, 16–c)		3	3
Intermediate Dressmaking (H. E. 17–b)		3	
House Decoration (H. E. 19–c)			2
House Management (H. E. 20–c)			3
Physical Education (Phys. Ed. 7–a, 8–b, 9–c)	1	1	1
Electives	4	2	5
	17	17	17

* Not required of those who offer Physics for entrance credit.

FOUR-YEAR COURSES

Senior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Home Nursing (H. E. 21–a)	2		
Special Methods (H. E. 27–b)		3	
‡*Practice Teaching* (H. E. 28–c)			8 or 9
Education, Vocational Education (Ed. 20–a)	3		
Education, School Hygiene (Ed. 28–c)			3
Sociology (Soc. 3–a, 4–b)	3	3	
Adolescent Psychology (Psych. 20–b)		3	
† *Electives and Practice House* (H. E. 22–a, b)	4 or 7	3 or 6	
	15 or 18	15 or 18	12

*ARTS COURSE IN CHEMISTRY

Freshman Year

Inorganic Chemistry (Chem. 1–a, 2–b, 3–c)	3	3	3
Qualitative Analysis (Chem. 4–c)			3
Trigonometry (Math. 1–a)	3		
Algebra (Math. 2–a, 3–b)	3	3	
Analytic Geometry (Math. 4–b, 5–c)		3	3
Calculus (Math. 6–c)			3
Zoölogy (Zoöl. 1–a, 2–b) *or* *Botany* (Bot. 1–a, 2–b)	3	3	
English (Eng. 1–a, 2–b, 3–c)	3	3	3
§*Military Art* (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
§*Physical Education*	½	½	½
	17	17	17

Sophomore Year

Organic Chemistry (Chem. 20–a, 21–b, 22–c)	2	3	3
Inorganic Prep. (Chem. 17–a)	2		
Qualitative Chemistry (Chem. 9–a)	3		
Quantitative Analysis (Chem. 18–b, 19–c)		5	7
German (Ger. 1–a, 2–b, 3–c) *or* *French* (Fr. 1–a, 2–b, 3–c)	3	3	3
Calculus (Math. 7–a)	3		
Machine Work (Shop 22–c)			3
Drawing (Draw. 5–a)	2		
§*Military Art* (M. A. 4–a, 5–b, 6–c)	1½	1½	1½
§*Physical Education*	½	½	½
Calculus (Math. 8–b) *or* *Electives*		3	
Elective		3	
	17	16	18

* Students planning to teach Chemistry are advised to elect subjects in Education.

† Practice House (H. E. 22–a, b) is required during the Fall or Winter Term. During the term this subject is taken, the student will be allowed to carry not more than 15 credit hours. The other one of the first two terms 18 credit hours should be carried.

‡ While practice teaching no other subject should be scheduled except Ed. 28–c.

§ Physical Education for Women giving 1 credit, is required of women students instead of Military Art and Physical Education for men as listed.

Junior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Physical Chemistry (Chem. 29–a, 30–b, 31–c)	3	3	3
Quantitative Analysis (Chem. 26–a, 27–b, 28–c)	4	4	4
Organic Laboratory (Chem. 23–b, 24–c)		2	2
Physics (Phys. 6–a, 7–b, 8–c)	3	3	3
Physics (Phys. 9–a, 10–b, 11–c)	3	3	3
Electives	3	3	3
	16	18	18

Senior Year

Physical Laboratory (Chem. 42–a)	2		
Advanced Inorganic Chemistry (Chem. 32–a)	3		
Thesis (Chem. 39–a, 40–b, 41–c)	5	5	5
Rare Elements (Chem. 33–b, 34–c)		3	3
Electives (three may be added to thesis each term)	6	9	9
	16	17	17

MECHANIC ARTS COURSE FOR TEACHERS

Freshman Year

English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 1–a, 2–b, 3–c)	3	3	3
Algebra (Math. 101–a)	3		
Trigonometry (Math. 1–a)	3		
Shop Mathematics (Math. 102–b)		3	
Practical Mathematics (Math. 103–c)			3
Engineering Drawing (Draw. 1–a)	3		
Machine Drawing (Draw. 2–b, 3–c)		3	3
Wood Work (Shop 1–a, 2–b, 3–c)	2	2	2
Military Art (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
Physical Education	½	½	½
Electives		2	2
	19	18	18

Sophomore Year

Qualitative Analysis (Chem. 4–a, 5–b)	3	3	
Introductory Physics (Phys. 1–a, 2–b, 3–c)	3	3	3
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Descriptive Geometry (Draw. 4–a)	3		
Free Hand Drawing (Draw. 102–b)		3	
Elements of Architecture (Draw. 103–c)			3
Wood Work (Shop 101–a, 102–b, 103–c)	2	2	2
Military Art (M. A. 4–a, 5–b, 6–c)	1½	1½	1½
Physical Education	½	½	½
Electives	2	2	8
	18	18	18

FOUR-YEAR COURSES

Junior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Advanced English Composition (Eng. 4–a)	3		
United States History (Hist. 10–a, 11–b)	3	3	
Secondary Education (Educ. 10–b, 11–c)		2	3
Elements of Psychology (Psych. 10–a)	3		
Citizenship (Pol. Sc. 5–c)			3
Dendrology (For. 2–c)			4
Architectural Drawing (Draw. 40–a, 41–b)	3	3	
Wood Work (Shop 9–a, 10–b)	2	2	
Carpentry (Shop 11–c)			2
Forge (Shop 21–c)			3
Electives	4	8	3
	18	18	18

Senior Year

Vocational Education (Educ. 20–a)	3		
School Hygiene (Educ. 28–c)			3
Social Pathology (Soc. 3–a)	3		
Economic History of the U. S. (Econ. 9–b)		3	
Economic History of Modern Europe (Econ. 11–c)			3
Adolescent Psychology (Psych. 24–b)		3	
Practice Teaching (Shop 26–a)	2		
Machine Work (Shop 23–a, 24–b, 25–c)	3	3	3
Manual Training Practice (Shop 27–b, 28–c)		2	2
Industrial Electricity (E. E. 6–a)	3		
Electives	4	7	6
	18	18	17

ENGINEERING DIVISION

CHARLES E. HEWITT, *Dean*

Chemical Engineering Course.—This course is intended to fit the student for the career of professional chemist or chemical engineer, and to give a good foundation for original and independent chemical research.

Instruction is imparted by lectures, recitations and a large amount of carefully supervised laboratory work. The laboratory study is largely an individual one, and the work of each student is conducted with reference not only to the particular object he may have in view, but also to the acquirement of a broad knowledge of chemical science. The student is given a thorough training in German and French to enable him to read with ease the chemical literature; a thorough grounding in mathematics, necessary for advanced theoretical chemistry or chemical engineering; a somewhat limited amount of special engineering work, both mechanical and electrical; and a thorough undergraduate training in theoretical and applied chemistry. He is encouraged to develop the power of solving chemical problems by independent thought through the aid of the reference works and chemical periodicals which the library contains.

Electrical Engineering Course.—The electrical engineering course is intended to meet the demands of young men fitting themselves for practical and professional engineering in connection with the various applications of electricity.

By means of lectures, recitations and laboratory work, the subjects of the course are brought to the attention of the student in such a manner as not only to emphasize the present needs of the practitioner and engineer, but to give him the principles that will enable him to grasp and understand the constantly increasing number of problems that require solution.

The instruction aims to impart a complete practical and theoretical knowledge of the best modern types of electrical

machines and appliances, and the methods of designing, building and operating them.

The rapid progress in recent years in applying electricity to commercial uses renders it difficult, if not impossible, for one without a technical education to gain prominence in the work and to be intrusted with its more responsible positions.

Mechanical Engineering Course.—The mechanical engineering course is intended to train young men for positions of responsibility in the field of the mechanical industries. The studies in the course are scientific, including mathematics, physics and chemistry; technical, including drawing, shop work, thermodynamics, hydraulics, machine design, electrical engineering, power engineering; and cultural, designed to fit him socially for his proper place in the world.

Instruction is given by means of text book work and laboratory work whenever possible. When necessary this work is supplemented by illustrated lectures and assigned reading. Throughout the course the theoretical work is supplemented by actual practice in mechanical operation and scientific research, by training in the use of tools for working wood and metals, and by experimental tests and demonstrations in the mechanical, chemical and physical laboratories.

ARCHITECTURAL, ELECTRICAL AND MECHANICAL CONSTRUCTION COURSES

The Engineering Division offers four-year courses in architectural, electrical and mechanical construction. These courses have been carefully prepared to meet the ever-increasing demand for strong four-year courses along practical lines. The present great demand for trained mechanics and technicians indicates clearly the need of training men in such courses.

The subjects offered in these courses have been so chosen as to involve less mathematics, physics and mechanics and more shop work, laboratory work and drawing than is required for the regular four-year engineering courses.

It will be noted that the subjects taken in the first term of the freshman year are the same as those given in the regular four-year electrical and mechanical engineering courses. The differentiation takes place at the end of the first term. These constructional courses are intended to fit a student for the practical work of a superintendent of construction, etc.

All of the subjects with numbers less than 100 are regular four-year subjects as given in the engineering courses, a description of which will be found in the catalog under the particular department in which the subject is given. All numbers from 100 to 200 are new subjects, adapted to meet the requirements of the new courses in Construction. Description of the new subjects will also be found under the department in which the subjects are given.

ENGINEERING DIVISION

ELECTRICAL AND MECHANICAL ENGINEERING COURSES

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1-a, 2-b, 3-c)	3	3	3
Inorganic Chemistry (Chem. 1-a, 2-b, 3-c)	3	3	3
Trigonometry (Math. 1-a)	3		
Algebra (Math. 2-a, 3-b)	3	3	
Analytical Geometry (Math. 4-b, 5-c)		3	3
Calculus (Math. 6-c)			3
Engineering Drawing (Draw. 1-a, 2-b, 3-c)	3	3	3
Woodwork (Shop 1-a)	2		
Forging (Shop 5-c)			2
Military Art (M. A. 1-a, 2-b, 3-c)	1½	1½	1½
Physical Education	½	½	½
	19	17	19

Sophomore Year

Qualitative Analysis Laboratory (Chem. 11-a, 12-b)	3	3	
Calculus (Math. 7-a, 8-b, 9-c)	3	3	3
Physics (Phys. 6-a, 7-b, 8-c)	3	3	3
Physics Laboratory (Phys. 9-a, 10-b, 11-c)	3	3	3
Kinematics of Machinery (M. E. 1-b)		3	
Mechanics of Engineering (M. E. 2-c)			4
Machine Work (Shop 6-a, 7-b, 8-c)	2	2	2
Descriptive Geometry (Draw. 4-a)	3		
Military Art (M. A. 4-a, 5-b, 6-c)	1½	1½	1½
Physical Education	½	½	½
	19	19	17

JUNIOR YEAR

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Dynamo Electric Machinery (E. E. 1-a, 2-b, 3-c)	4	4	4
Mechanics of Engineering (M. E. 3-a, 4-b)	3	3	
Mechanics Laboratory (M. E. 5-a, 6-b, 7-c)	2	2	2
Materials of Construction (M. E. 8-a)	3		
Valve Gear and Boiler Design (M. E. 9-a)	3		
Machine Design (M. E. 10-b, 11-c)		3	3
Thermodynamics (M. E. 14-b, 15-c)		3	3
Electives	3	3	6
	18	18	18

Electrical Engineering

SENIOR YEAR

Surveying (Math. 19-a, 20-c)	3		3
Electrical Engineering Practice (E. E. 7-a, 8-b)	3	3	
Electrical Laboratory (E. E. 11-a, 12-b, 13-c)	3	3	3
Electric Railways (E. E. 10-b)		3	
Hydro-Electric Development (E. E. 9-c)			3
Illuminating Engineering (E. E. 19-c)			3
Design of Electrical Machinery (E. E. 18-c)			3
Contracts and Specifications (E. E. 20-c)			2
Power Plant Engineering (M. E. 16-a, 17-b)	3	3	
Mechanical Laboratory (M. E. 18-a)	2		
Hydraulics (M. E. 12-a, 13-b)	3	3	
Pattern Making (Shop 29-c)			2
Elective		1	
	17	16	19

Mechanical Engineering

SENIOR YEAR

Surveying (Math. 19-a, 20-c)	3		3
Power Plant Engineering (M. E. 16-a, 17-b)	3	3	
Mechanical Laboratory (M. E. 18-a, 19-b, 20-c)	2	2	2
Industrial Engineering (M. E. 25-a, 26-b)	3	2	
Hydraulics (M. E. 12-a, 13-b)	3	3	
Machine Design (M. E. 23-b, 24-c)		2	2
Heat and Ventilation (M. E. 21-b, 22-c)		3	3
Hydro-Electrical Development (E. E. 9-c)			3
Contracts and Specifications (E. E. 20-c)			2
Woodwork (Shop 29-c)			2
Electives	3	3	
	17	18	17

ELECTIONS FOR ELECTRICAL AND MECHANICAL ENGINEERING

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Principles of Economics (Econ. 1–a, 2–b)	3	3	
Labor Problems (Econ. 4–a)	3		
Corporation Finance (Econ. 7–a)	3		
Business Accounting (Econ. 12–a, 13–b, 14–c)	3	3	3
Cost Accounting (Econ. 15–a, 16–b)	3	3	
Money and Banking (Econ. 5–b)		3	
Transportation (Econ. 10–b)		3	
Industrial and Commercial Geography (Econ. 3–c)			3
Principles of Public Finance (Econ. 6–c)			3
Economic History of Modern Europe (Econ. 11–c)			3
Social Pathology and Modern Philanthropy (Soc. 1–a, 2–b)	3	3	
Introduction to Psychology (Psych. 1–b, 2–c)		3	3
American Constitutional Law (Pol. Sc. 2–b)		3	
International Law (Pol. Sc. 3–c)			3
Writing for Publication (Eng. 6–c)			3
Public Speaking (Eng. 7–c)			3
Advanced Calculus (Math. 10–a, 11–b, 12–c)	3	3	3
Advanced Analytic Geometry (Math. 16–a, 17–b, 18–c)	3	3	3
Theory of Equations and Determinants (Math. 14–b, 15–c)		3	3
Problems (E. E. 21–b)		2	
Telegraph and Telephone (E. E. 4–c)			3
Machine Work (Shop 108–b, 109–c)		2	2
Military Art (M. A. 7–a, 8–b, 9–c)	3	3	3
Military Art (M. A. 10–a, 11–b, 12–c)	3	3	3

CHEMICAL ENGINEERING COURSE

Freshman Year

English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
French (Fr. 1–a, 2–b, 3–c) *or* *German* (Ger. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 1–a, 2–b, 3–c)	3	3	3
Trigonometry (Math. 1–a)	3		
Algebra (Math. 2–a, 3–b)	3	3	
Analytic Geometry (Math. 4–b, 5–c)		3	3
Calculus (Math. 6–c)			3
Drawing (Draw. 5–a)	2		
Military Art (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
Physical Education	½	½	½
	19	17	17

FOUR-YEAR COURSES

Sophomore Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
German (Ger. 4-a, 5-b, 6-c)	3	3	3
Organic Chemistry (Chem. 19-a, 20-b, 21-c)	2	3	3
Qualitative Analysis (Chem. 10-a)	6		
Quantitative Analysis (Chem. 17-b, 18-c)		5	7
Calculus (Math. 7-a, 8-b, 9-c)	3	3	3
Mineralogy (Miner. 1-b)		3	
Military Art (M. A. 4-a, 5-b, 6-c)	1½	1½	1½
Physical Education	½	½	½
	16	19	18

Junior Year

Physical Chemistry (Chem. 28-a, 29-b, 30-c)	3	3	3
Organic Chemical Laboratory (Chem. 23-a, 24-b)	2	2	
Quantitative Analysis (Chem. 25-a, 26-b, 27-c)	4	5	4
Physics (Phys. 6-a, 7-b, 8-c)	3	3	3
Physics (Phys. 9-a, 10-b, 11-c)	3	3	3
Machine Work (Shop 22-c)			3
Electives	3	3	3
	18	19	19

Senior Year

Industrial Chemistry (Chem. 34-a, 35-b, 36-c)	3	3	3
Physical Chemistry Laboratory (Chem. 41-a)	2		
Quantitative Analysis (Chem. 37-a)	4		
Thesis (Chem. 39-b, 40-c)		6	6
Electrical Engineering (E. E. 15-a, 16-b, 17-c)	3	3	3
Mechanical Engineering (M. E. 8-a)	3		
Mechanical Engineering (M. E. 14-b, 15-c)		3	3
Electives	3	3	3
	18	18	18

ARCHITECTURAL, ELECTRICAL AND MECHANICAL CONSTRUCTION COURSES

Freshman Year

English Composition (Eng. 1-a, 2-b, 3-c)	3	3	3
Inorganic Chemistry (Chem. 1-a, 2-b, 3-c)	3	3	3
Trigonometry (Math. 1-a)	3		
Algebra (Math. 101-a)	3		
Shop Mathematics (102-b)		3	
Practical Mathematics (103-c)			3
Engineering Drawing (Draw. 1-a, 2-b, 3-c)	3	3	3
Wood Work (Shop 1-a, 2-b, 3-c)	2	2	2
Military Art (M. A. 1-a, 2-b, 3-c)	1½	1½	1½
Physical Education	½	½	½
Electives		3	3
	19	19	19

Sophomore Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Qualitative Analysis Laboratory (Chem. 11–a, 12–b)	3	3	
Physics (Phys. 1–a, 2–b, 3–c)	3	3	3
Accounting (Econ. 12–a, 13–b, 14–c)	3	3	3
Descriptive Geometry (Draw. 4–a)	3		
Free Hand Drawing (Draw. 102–b)		3	
Elements of Architecture (Draw. 103–c)			3
Wood Work (Shop 101–a) *or* *Forging* (Shop 104–a)	2		
Wood Work (Shop 102–b, 103–c) *or* *Machine Work* (Shop 105–b, 106–c)		2	2
Mechanics of Engineering (M. E. 101–b, 102–c)		3	3
Military Art (M. A. 4–a, 5–b, 6–c)	1½	1½	1½
Physical Education	½	½	½
	16	19	16

ARCHITECTURAL CONSTRUCTION COURSE

Junior Year

Architectural Drawing (Draw. 104–a, 105–b, 106–c)	3	3	3
Building Construction (Draw. 107–b, 108–c)		4	4
Elements of Electrical Construction (E. E. 101–a, 102–b, 103–c)	3	3	3
Materials of Construction (M. E. 8–a)	3		
Mechanics of Engineering (M. E. 103–a)	3		
Mechanical Laboratory (M. E. 107–a)	2		
Clay Products and Building Stones (Geol. 100–b)		2	
Heating, Ventilating, Plumbing and Electrical Appliances (Phys. 101–c)			3
Electives	3	6	6
	17	18	19

Senior Year

Building Construction and Design (Draw. 109–a, 110–b)	8	8	
Architectural Thesis (Draw. 111–c)			8
Contracts and Specifications (Draw. 112–c)			1
Heating and Ventilating (M. E. 111–a, 112–b)	4	4	
Industrial Engineering (M. E. 113–c)			3
Surveying (Math. 22–a, 23–c)	3		3
Electives	3	6	3
	18	18	18

ELECTRICAL AND MECHANICAL CONSTRUCTION COURSES

Junior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Elements of Electrical Construction (E. E. 101–a, 102–b, 103–c)	3	3	3
Materials of Construction (M. E. 8–a)	3		
Mechanics of Engineering (M. E. 103–a)	3		
Mechanical Laboratory (M. E. 107–a, 108–b, 109–c)	2	2	2
Boiler Design and Graphics (M. E. 104–a)	3		
Boilers and Engines (M. E. 105–b)		3	
Machine Design (M. E. 110–b)		2	
Engines and Turbines (M. E. 106–c)			3
Machine Work (Shop 107–a, 108–b, 109–c)	2	2	2
Electives	3	6	9
	19	18	19

Senior Year

Electric Machinery (E. E. 103–a, 104–b) *or* *Heating and Ventilating* (M. E. 111–a, 112–b)	4	4	
Electric Lab. (E. E. 105–a, 106–b, 107–c) *or* *Mechanical Lab.* (M. E. 114–a 115–b, 116–c)	2	2	2
Electric Design (E. E. 108–a, 109–b)	2	3	
Hydro-Electric Development (E. E. 9–c) *or* *Contractors and Specifications* (E. E. 20–c)			2
Hydraulics (M. E. 119–b)		3	
Power Plants (M. E. 118–c)		3	3
Industrial Engineering (M. E. 113–c)			3
Surveying (Math. 22–a, 23–c)	3		3
Electives	6	3	4
	17	18	17

ELECTIONS FOR ARCHITECTURAL, ELECTRICAL AND MECHANICAL CONSTRUCTION COURSES

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Principles of Economics (Econ. 1–a, 2–b)	3	3	
Labor Problems (Econ. 4–a)	3		
Corporations (Econ. 7–a)	3		
Business Accounting (Econ. 12–a, 13–b, 14–c)	3	3	3
Cost Accounting (Econ. 15–a, 16–b)	3	3	
Money and Banking (Econ. 5–b)		3	
Transportation (Econ. 10–b)		3	
Industrial and Commercial Geography (Econ. 3–c)			3
Principles of Public Finance (Econ. 6–c)			3
Economic History of Modern Europe (Econ. 11–c)			3
Introduction to Psychology (Psych. 1–b, 2–c)		3	3
Social Pathology and Modern Philanthropy (Soc. 1–a, 2–b)	3	3	
American Constitutional Law (Pol. Sc. 2–b)		3	
Laws of Business (Pol. Sc. 1–a)	3		
International Law (Pol. Sc. 3–c)			3
The State (Pol. Sc. 4–c)			3
Writing for Publication (Eng. 6–c)			3
Public Speaking (Eng. 7–c)			3
Dendrology (For. 2–a)	4		
Problems (E. E. 21–b)		2	
Telegraph and Telephone (E. E. 4–c)			3
Military Art (M. A. 7–a, 8–b, 9–c)	3	3	3
Military Art (M. A. 10–a, 11–b, 12–c)	3	3	3

DESCRIPTION OF STUDIES

Departments are arranged alphabetically under their respective administrative divisions.

The number and title of each subject is given in black face type. The number of each subject is divided into two parts: first, the numeral designating the particular subject; and second, the letter (a, b, or c) designating the term in which the subject is given. The letter "a" indicates that a subject is given the first term; "b," the second term; and "c," the third term. A combination of the letters (a–b, b–c or a–b–c) attached to a numeral indicates that the subject is given through the term represented by each of the letters.

Following the number of each subject is the description of the work given, and the name of the instructor.

The next paragraph gives the following information in the order indicated: (1) prerequisites, if any; (2) in what courses the subject is required and the undergraduate year in which it should be taken; (3) the number of credits the subject will count toward graduation; (4) the number of lectures, recitations, or laboratory periods required a week. (Lectures and recitations are fifty minutes in length. Laboratory periods are two and one-half hours in length and an additional half-hour of work may be required for one credit hour.)

All subjects unless otherwise noted are open to students who have passed the prerequisites.

An elective subject will be given only when there is a minimum of five students registered for the same.

AGRICULTURAL DIVISION

FREDERICK W. TAYLOR, *Dean*

DEPARTMENTS

AGRONOMY
BOTANY
ENTOMOLOGY
HORTICULTURE
ANIMAL HUSBANDRY
DAIRY HUSBANDRY
FORESTRY
POULTRY HUSBANDRY

AGRICULTURE

FREDERICK W. TAYLOR, *Professor*

1–b. Survey of Agriculture. A brief history of agriculture as a business and scientific profession in this country; a general discussion and survey of the various branches of agriculture and the opportunities for work which each affords. The subject is intended primarily to assist the student in selecting his technical subjects in the later years of his college course. Professor Taylor.

Required of Freshmen in Agriculture. 1 credit: 1 lecture.

2–a. **Methods of Teaching.** In this subject will be included a discussion of the ways and means of presenting the subject-matter of the various phases of agriculture to the pupils in secondary schools; the handling of pupil projects; the organization and operation of a farm; and the relation of school agriculture to the farming of the community. Four to six weeks of practice teaching.

Required of Seniors taking the Teacher Training course. 3 credits: 3 lectures.

3–b. **Agricultural Seminar.** Library and reference work, the preparation of bibliographies, a study of the work and history of agricultural colleges and experiment stations. Professor Taylor.

Elective for Seniors in Agriculture. 1 credit: 1 lecture.

4–c. **Practice Teaching.** This subject will extend over a period of at least nine weeks in the spring term, during which the student will teach in some secondary school selected by the State Department of Education and the head of the Department of Education at New Hampshire College. The teaching work will be done under the supervision of a specialist in methods of agricultural education.

Required of Seniors taking the Teacher Training course and open only to these students. 12 credits.

AGRONOMY

FREDERICK W. TAYLOR, *Professor*
M. GALE EASTMAN, *Assistant Professor*

1–a. **Agricultural Engineering.** Lectures and recitations upon the mapping of farms; fencing; drainage; farm sanitation; tillage and harvesting machinery; concrete construction; silos; farm motors; roads and principles of draft. Practical work in map making, laying out drains, rope splicing, comparing farm machines, etc. Professor Taylor.

Required of Sophomores in Agriculture. 4 credits: 3 lectures; 1 laboratory.

2–a. **Field Crops.** Text book and recitations upon the history, use, value and methods of culture of our various field crops, including hay and grass, with particular reference to New England conditions. Laboratory practice in judging the different varieties of grains and grasses. Assistant Professor Eastman.

Required of Juniors in Agriculture, except in Forestry course. 3 credits: 2 lectures; 1 laboratory.

3–b. **Field Crops.** A continuation of 2–a.

Required of Juniors in Agriculture, except in Forestry course. 3 credits: 2 lectures; 1 laboratory.

4–c. Soils. Text book and recitations upon the formation, kinds and physical properties of soils; the movements and conservation of soil moisture; the relation of heat and air to soil; the nature and physical effects of tillage and fertilizers; laboratory work and experimentation with soils to show the physical effects of different conditions and texture. Assistant Professor Eastman.

Required of Juniors in Agriculture. 4 credits: 3 lectures; 1 laboratory.

5–b. Soil Fertility. Lectures, text book and recitations upon the chemistry of soils and the principles of fertility. Professor Taylor.

Prerequisite: Chemistry 3–c. Required of Seniors in Agriculture, except in Forestry course. 3 credits: 3 recitations.

6–c. Fertilizers. Lectures, text book and recitations upon the value, use and function of plant food materials, including manure, and upon the compounding and selection of fertilizers. Professor Taylor.

Prerequisite: Chemistry 3–c. Required of Seniors in Agriculture, except in Forestry course. 3 credits: 3 recitations.

7–c. Farm Accounting. Lectures and reference work relating to the principles of accounting and their application to the farm business. Laboratory exercises will include sets of complete cost accounts taken from actual farms. Assistant Professor Eastman.

Elective for Juniors. 3 credits: 1 lecture; 2 laboratories.

8–a. Farm Management. Text book, lectures and recitations upon the development of farming as a business, types of farming, size of farms, cropping systems, live stock problems, the marketing of farm products, and choosing and buying a farm. Practical work will be given in laying out farms, and in studying survey records of individual farms in order to find the labor income; also in analyzing the farm business record for the purpose of determining the effect of efficiency factors on the profits made. Exercises will be given in the arrangement and rearrangement of farm buildings, plotting the distribution of labor, and taking survey records. Assistant Professor Eastman.

Required of Seniors in Agriculture, except in Forestry course. 4 credits: 2 lectures; 2 laboratories.

9–b. Agricultural Statistics. An advanced subject for those who wish to familiarize themselves with proper methods of obtaining and tabulating statistics and experimental data. Lectures and laboratory work will deal with some of the common sources of error likely to affect scientific findings as well as everyday conclusions. Assistant Professor Eastman.

Elective for Seniors. 2 credits: 1 lecture; 1 laboratory.

10–c. **Types of Farming.** A statistical study of the types of farming in the United States, with special reference to crop rotation, area in crops, use of machinery, efficiency of man and horse labor, adaptability of crops and animals, and relative profits. Assistant Professor Eastman.

Elective for Seniors. 3 credits: 1 lecture; 2 laboratories.

11–b. **Special Agronomy.** Advanced work for students interested in some particular phase of Agronomy. No class exercises. The hours and kind of work must be arranged with the department before the subject is elected. Professor Taylor.

Prerequisites: Agronomy 1–a to 5–b inclusive. Elective for Seniors. 1 to 3 credits.

ANIMAL HUSBANDRY

Otto L. Eckman, *Professor*
Clifford J. Fawcett, *Assistant Professor*

1–a. **Types and Breeds of Live Stock.** A study of the different breeds of horses, cattle, sheep, and swine in respect to their origin, history, development, characteristics, and adaptability to different conditions of climate and soil. One afternoon each week is devoted to judging the different breeds. Assistant Professor Fawcett.

Required of Freshmen in Agriculture. 4 credits: 3 recitations; 1 laboratory.

2–c. **Live Stock Judging.** The work consists of a study of the principles and practice of judging horses, beef cattle, sheep, and swine, and of the market classes and grades of horses and meat animals. Students intending to compete for the live stock judging team should elect this subject. For laboratory work, trips are taken to some of the best breeding establishments in New England. Assistant Professor Fawcett.

Prerequisite: Animal Husbandry 1–a. Required of students in the Teacher Training course. 3 credits: 3 recitations.

3–c. **Feeds and Feeding.** An elementary study of the laws of nutrition, the character, composition, and digestibility of feed stuffs, and methods of feeding different kinds of farm animals. Numerous samples of grains and by-products are used for the purpose of familiarizing the students with the different feed stuffs. Practice is given in calculating rations for various purposes. Professor Eckman.

Prerequisite: Chemistry 3–c. Required of Juniors in Animal Husbandry, Dairying Husbandry and Teacher Training courses. 4 credits: 3 recitations; 1 laboratory.

4–a. **Anatomy of Farm Animals.** Lectures and recitations upon the form and structure of the domesticated animals. Skeletons, various anatomical specimens, models, charts, and lantern slides are used to make the subject as practical as possible. The purposes of this subject are to show the relation between the skeleton and the form and function of the animal, and to serve as a foundation for the intelligent study of animal diseases and ailments. Professor Eckman.

Required of Juniors in Animal Husbandry. 4 credits: 3 recitations; 1 laboratory.

5–b. **Infectious Diseases of Animals.** A study of the more common economic infectious diseases of farm animals, their prevention and treatment, and general sanitation. Professor Eckman.

Prerequisite: Animal Husbandry 4–a. Required of Juniors in Animal Husbandry. 4 credits: 3 recitations; 1 laboratory.

6–c. **Non-Infectious Diseases and Ailments.** A study of the common non-infectious diseases and ailments of farm animals and their treatment; unsoundness of the horse, principles of horseshoeing, and the practice of simple surgical operations. Professor Eckman.

Prerequisite: Animal Husbandry 4–a. Required of Juniors in Animal Husbandry. 4 credits: 3 recitations; 1 laboratory.

7–a. **Animal Breeding.** A study of the principles and practices of breeding farm animals. Practice is given in tracing out and studying pedigrees. Professor Eckman.

Prerequisite: Animal Husbandry 1–a. Required of Seniors in Animal Husbandry, Dairy Husbandry and Teacher Training courses. 4 credits: 3 recitations; 1 laboratory.

8–c. **Live Stock Markets and Products.** A study of the various kinds of live stock markets and of the methods and regulations applying to the transportation of live stock. Some time will be spent in a study of the live stock centers, the stock yards, and the government inspection of animals before and after slaughter. The butchering of animals on the farm and the various cuts of meats will be discussed. References will be supplied to the student for individual work. Occasional trips will be taken to slaughter houses and packing plants. Assistant Professor Fawcett.

Prerequisite: Animal Husbandry 2–c. Elective for Seniors. 3 credits: 3 recitations.

9–a. **Sheep and Swine Husbandry.** A consideration of the judging, breeding, feeding, management and preparation for the show ring of

sheep and swine, with special reference to New Hampshire conditions. Assistant Professor Fawcett.

Prerequisites: Animal Husbandry 1–a and 3–c. Elective for Seniors. 4 credits: 3 recitations; 1 laboratory.

10–b. **Management of Horses and Beef Cattle.** Lectures and recitations upon the care of brood mares and cows, management of stallions and bulls, the breaking and training of colts, preparation of animals for the show ring, the management of pure bred beef herds, and the feeding and handling of steers and oxen. Professor Eckman.

Prerequisites: Animal Husbandry 1–a and 3–c. Elective for Seniors. 4 credits: 3 recitations; 1 laboratory.

11–c. **Animal Nutrition.** An advanced consideration of the subject of digestion, absorption and assimilation; a study of the relationship of various feeds to nutrition, their composition and digestibility, and their function in metabolism. Professor Eckman.

Prerequisite: Animal Husbandry 3–c. Elective for Seniors. 3 credits: 3 recitations.

BOTANY

ORMOND R. BUTLER, *Professor*
FREDERICK C. WERKENTHIN, *Associate Professor*
—— ——, *Instructor*

1–a. **General Botany.** The purpose of this subject is to give the student a general knowledge of the morphology, evolution, and classification of plants and the structure of cells and tissues. Representative types in the plant kingdom, beginning with the simple forms, are studied to show the development of the plant body, the increase in specialization of the reproductive process, and the adaption of plants to dry land conditions. Associate Professor Werkenthin.

Required of Freshmen in Agriculture. 3 credits: 1 lecture; 2 laboratories.

2–b. **General Botany.** Continuation of 1–a. Associate Professor Werkenthin.

Prerequisite: Botany 1–a. Required of Freshmen in Agriculture. 3 credits: 1 lecture; 2 laboratories.

3–c. **General Botany.** Continuation of 2–b. Associate Professor Werkenthin.

Prerequisite: Botany 2–b. Required of Freshmen in Agriculture. 3 credits: 1 lecture; 2 laboratories.

4–b. **Plant Physiology.** Structure and properties of the cell; absorption and movement of water; metabolism; growth and irritability.

Prerequisite: Botany 3–c. Required of Juniors in Forestry and Horticulture. 3 credits: 1 lecture; 2 laboratories.

5–c. **Plant Physiology.** Continuation of 4–b.

Prerequisite: Botany 4–b. Required of Juniors in Forestry and Horticulture. 3 credits: 1 lecture; 2 laboratories.

6–a. **Plant Histology.** Characterization and differentiation of plant tissues; micro-technique.

Prerequisite: Botany 3–c. Required of Juniors in Forestry. 2 credits: 2 laboratories.

7–b. **Plant Histology.** Continuation of 6–a.

Prerequisite: Botany 6–a. Required of Juniors in Forestry. 2 credits: 2 laboratories.

8–a. **General Bacteriology.** Lectures on the morphology and physiology of the bacteria, the principal bacterial diseases, and the rôle of bacteria in the arts and industries. Associate Professor Werkenthin.

Required of all Agricultural students (excepting those in the Animal Husbandry and Dairy Husbandry course) and of Juniors in Home Economics. 3 credits: 3 lectures.

9–a. **Bacteriology.** Lectures and laboratory work on the morphology, taxonomy and physiology of the bacteria, the technique of isolation, and the principles of sterilization. Special attention is given to the bacteriological analysis of water, milk, and soils. Associate Professor Werkenthin.

Required of Animal Husbandry and Dairy Husbandry students. Students required to take Botany 8–a may substitute this subject on approval of the instructor. 3 credits: 1 lecture; 2 laboratories.

10–b. **Bacteriology.** Continuation of 9–a. Associate Professor Werkenthin.

Prerequisite: Botany 9–a. 3 credits: 1 lecture; 2 laboratories.

11–c. **Bacteriology.** Continuation of 10–b. Associate Professor Werkenthin.

Prerequisite: Botany 10–b. 3 credits: 1 lecture; 2 laboratories.

12–a. **Plant Pathology.** The fungous diseases of plants; their symptoms, cause and prevention. Associate Professor Werkenthin.

Prerequisite: Botany 3–c. Required of Seniors in Horticulture and Forestry. 3 credits: 1 lecture; 2 laboratories.

13–b. **Plant Pathology.** Continuation of 12–a. Associate Professor Werkenthin.

Prerequisite: Botany 12–a. 2 credits: 2 laboratories.

14–b. **Fungous Diseases of Plants.** The principal fungous diseases, their cure and prevention. The subject is designed to give the student such training in the identification of the common fungous maladies of our agricultural crops as will be serviceable in farming, school garden work, or any position in the field of plant industry in which elementary knowledge is sufficient or desirable. Associate Professor Werkenthin.

2 credits: 1 lecture; 1 laboratory.

15–a, b, c. **Advanced Botany.** The subject-matter will depend upon the training and desire of the student. It cannot be elected without previous consultation. Professor Butler and Associate Professor Werkenthin.

Credit hours by arrangement, one or more terms.

DAIRY HUSBANDRY

JOHN M. FULLER, *Professor*
HEBER F. DEPEW, *Instructor*
B. E. HUGGINS, *Instructor*

1–b. **Farm Dairying.** A general survey of the field of dairy husbandry. Such topics as the use of the Babcock test, farm separators, farm buttermaking and farm cheesemaking, and marketing dairy products, are included. Professor Fuller.

Required of Sophomores in Agriculture. 4 credits: 3 lectures; 1 laboratory.

2–c. **Dairy Cattle Judging.** Animals in college herd and in nearby herds will be judged. Professor Fuller.

Elective especially for Sophomores. All students of Agriculture interested in the dairy cattle judging team should elect this subject, to be followed by Dairy Husbandry 3–a. 2 credits: 1 lecture; 1 laboratory.

3–a. **Milk Production.** The field of dairy husbandry in its relation to the producer. Feeding dairy animals; systems of herd feeding; silage and soiling; raising dairy animals; dairy herd development; dairy barns; advanced registry management; fitting dairy animals for show; dairy cattle judging. Professor Fuller.

Elective for Juniors and Seniors. 4 credits: 3 lectures; 1 laboratory.

4–a. **Testing Dairy Products.** A thorough study of the Babcock test, with special work in testing various dairy products for butter fat; acidity tests for milk and cream; moisture tests for butter and cheese; use of lactometer. Mr. DePew.

Elective for Juniors and Seniors. 2 credits: 1 lecture; 1 laboratory.

5–b. **Market Milk.** Food value of milk; production, handling, and distribution of market and certified milk; dairy farm inspection; control of milk supply. Professor Fuller.

Required of Juniors in Animal and Dairy Husbandry, and Teacher Training courses. 4 credits: 3 lectures; 1 laboratory.

6–b. **Ice Cream and Cheesemaking.** (1) Lectures and laboratory work covering the manufacture of the more important types of cheese. (2) The making, handling, and marketing of ice cream and ices. Mr. DePew.

Elective for Juniors and Seniors. 4 credits: 2 lectures; 2 laboratories.

7–c. **Buttermaking.** A study of the secretion and of the chemical and physical properties of milk; pasteurization; cream ripening, starters, churning; organization and operation of factories. Mr. DePew.

4 credits: 2 lectures; 2 laboratories.

8–a. **Domestic Dairying.** Nutritive value of milk; market milk; modified milk; certified milk; condensed milk; milk powder; fermented milk; butter; cheese; and ice cream. Laboratory exercises are given in the manufacture of dairy products. Mr. DePew.

Elective for Juniors and Seniors in Home Economics and in Arts and Science courses. 3 credits: 2 lectures; 1 laboratory.

9–c. **Dairy Bacteriology.** Methods of bacteriological analysis of milk and its products; isolation and study of the different types of dairy bacteria; relation of bacteria to milk and its products; study of effect on bacteria in milk of separation, clarification, pasteurization, aeration, and straining; and the application of bacteriological principles to the dairy industry. Mr. DePew.

Prerequisite: Botany 8–a. Elective for Seniors in Animal Husbandry and Dairy Husbandry courses. 3 credits: 1 lecture; 2 laboratories.

10–c. **Dairy Research.** A study of experiment station and other dairy literature. Professor Fuller.

1 credit: 1 lecture.

ENTOMOLOGY

WALTER C. O'KANE, *Professor*
CLARENCE R. CLEVELAND, *Assistant Professor*

1–a. **Principles of Economic Entomology.** The relation of the structure and classification of insects to methods of insect control. The

preparation and application of insecticides. Spray machinery and appliances. Professor O'Kane and Assistant Professor Cleveland.

Required of Sophomores in Agriculture. Elective for Sophomores, Juniors and Seniors in other courses. 4 credits: 3 recitations; 1 laboratory.

2-b. **Insects of Orchard and Garden.** The application of methods of insect control to typical injurious species. Studies in the life histories and habits of important insect pests of orchard, garden and certain field crops. Adapted especially for students in Horticulture and in General Agriculture. Assistant Professor Cleveland.

Prerequisite: Entomology 1-a. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

3-a. **Insects of Domestic Animals.** The insect enemies of domestic live stock; their life histories, habits and means of their control. Adapted especially for students in Animal Husbandry. Assistant Professor Cleveland.

Prerequisite: Entomology 1-a. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

4-b. **Household Insects. Medical Entomology.** The life histories, habits and means of control of insects of the household and of stored products. The relation of insects to disease. Adapted especially for students in Home Economics. Professor O'Kane and Assistant Professor Cleveland.

Elective for Sophomores, Juniors and Seniors. 3 credits: 3 lectures.

5-a. **Advanced Economic Entomology.** Detailed studies of problems involved in applied entomology. The literature of economic entomology. Investigational methods. Practice in arranging projects. Original investigations in the life history and habits of one or more injurious species. Adapted for advanced students. Professor O'Kane and Assistant Professor Cleveland.

Elective for Juniors and Seniors. Open to students only by permission of head of department. Credits and hours to be arranged.

6-b. **Advanced Economic Entomology.** Continuation of 5-a. Professor O'Kane and Assistant Professor Cleveland.

Elective for Juniors and Seniors. Open to students only by permission of head of department. Credits and hours to be arranged.

7-c. **Advanced Economic Entomology.** Continuation of 5-a and 6-b. Professor O'Kane and Assistant Professor Cleveland.

Elective for Juniors and Seniors. Open to students only by permission of head of department. Credits and hours to be arranged.

8–c. **Forest Insects.** Studies in the life histories and habits of the more destructive forest insects and the means of their control. Especially adapted for students in Forestry. Assistant Professor Cleveland.

Prerequisite: Entomology 1–a. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

FORESTRY

KARL W. WOODWARD, *Professor*
ALBERT W. GAMASH, *Assistant Professor*

1–a. **Principles of Forestry.** This subject is intended to meet the needs of students of Agriculture who desire an intelligent appreciation of the possibilities of the farm woodlot, and of others who wish to obtain a general knowledge of the principles of forestry. The value of forests, their protection, their utilization, their improvement, and regeneration are all discussed with special reference to New Hampshire conditions. Professor Woodward.

Required of all Sophomores in Agriculture. 4 credits: 3 lectures; 1 laboratory.

2–a. **Dendrology.** In this course are considered the uses and grades of lumber and other wood products, the identification of woods and the identification of our native tree species. Assistant Professor Gamash.

Required of Juniors in Forestry. 4 credits: 2 recitations; 2 laboratories.

3–a. **Silviculture.** The growing of timber crops, including the laws of forest growth, the improvement of immature stands, and forest regeneration both natural and artificial. Lectures and recitations, supplemented by field practice. Professor Woodward.

Required of Juniors in Forestry. 3 credits: 2 lectures; 1 laboratory.

4–b. **Silviculture.** A continuation of 3–a. Professor Woodward.

Prerequisite: Forestry 3–a. Required of Juniors in Forestry. 3 credits: 2 lectures; 1 laboratory.

5–c. **Silviculture.** Continuation of 4–b. Professor Woodward.

Prerequisite: Forestry 4–b. Required of Juniors in Forestry. 3 credits: 2 lectures; 1 laboratory.

6–b. **Forest Mensuration.** Principles and methods of scaling logs and cord wood and estimating lumber; also a study of the diameter, height, growth and yield of the commercial tree species found in New Hampshire. Assistant Professor Gamash.

Required of Juniors in Forestry. 4 credits: 2 lectures; 2 laboratories.

7–b. **Forest Management.** The management of woodlots and large forest tracts for the purpose of gaining the largest immediate and future returns; and the preparation of working plans to co-ordinate the lumbering, protection, improvement, and regeneration of forests so as to make them yield the highest net returns. Professor Woodward.

Prerequisites: Forestry 2–a, 5–c and 6–b. 3 credits: 1 lecture; 2 laboratories.

8–c. **Forest Management.** Continuation of 7–b. Professor Woodward.

Prerequisite: Forestry 7–b. 3 credits: 2 lectures; 1 laboratory.

9–a. **Forest Protection.** Consideration of measures for the protection of forests from fire, insects, fungous diseases, grazing, trespass, and taxes; and an examination of the federal and state laws relating to forest interests. Assistant Professor Gamash.

Prerequisite: Forestry 1–a. Required of Seniors in Forestry. 3 credits: 1 lecture; 2 laboratories.

10–a. **Advanced Forestry.** Work to be arranged according to the needs of individual students. Professor Woodward.

Prerequisites: Forestry 2–c, 5–c, and 6–c. Elective for Seniors in Forestry. 3 credits: 3 recitations.

11–b. **Advanced Forestry.** A continuation of 10–a. Professor Woodward.

Prerequisite: Forestry 10–a. 3 credits: 3 recitations.

12–c. **Advanced Forestry.** A continuation of 11–b. Professor Woodward.

Prerequisite: Forestry 11–b. 3 credits: 3 recitations.

13–b. **Forest Utilization.** A study of the methods and costs of logging, sawmilling and marketing, with special reference to the portable sawmill type of operation. Assistant Professor Gamash.

Required of Seniors in Forestry. 3 credits: 2 lectures; 1 laboratory.

14–b. **Practice of Forestry.** Development and present status of forestry in different countries; the work of the federal government and its management of the national forests; state forest policies; the lumber industry in the United States. Lectures and special readings. Professor Woodward.

Prerequisites: Forestry 2–a, 5–c and 6–b. Required of Seniors in Forestry. 4 credits: 4 recitations.

15–c. **Town Forest Problems.** A detailed study, for one who has had Forestry 51, of the forest problems of his home town. Aimed to

prepare those who are planning to settle in a definite locality to become expert in timber estimating and valuation, and artificial and natural regeneration in that locality. Individual conferences and reports. Professor Woodward.

Prerequisite: Forestry 1–a or (Forestry 51—1918–1919 catalog). 3 credits: 3 recitations.

HORTICULTURE

JOSEPH H. GOURLEY, *Professor*
WILLIAM H. WOLFF, *Associate Professor*
J. R. HEPLER, *Assistant Professor*
JAMES MACFARLANE, *Instructor*

1–c. **Vegetable Gardening.** This subject is designed to give a working knowledge of the various phases of vegetable production. It includes a study of garden soils, germination and planting of seeds, selection of varieties with reference to conditions in the state, construction and management of hot beds and cold frames, fertilizing, irrigation, and the packing and marketing of vegetables. Assistant Professor Hepler.

Required of Sophomores in Agriculture. 3 credits: 2 recitations; 1 laboratory.

2–a. **Greenhouse Construction and Management.** This subject aims to familiarize the student with modern methods of greenhouse work and the more important plants grown under glass. Sorts, varieties, culture, marketing, and enemies of greenhouse plants are studied. Each student is required to do practical work in propagating, potting, watering and ventilating. A study is made of the history and development of different types of greenhouses, including methods of heating and general management. Assistant Professor Hepler.

Required of Juniors in Horticulture. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

3–c. **Practical Pomology.** A study of the fundamental problems of fruit growing; such as location, choice of site, kind and adaptability of soil for fruit growing, soil management, planting of orchards, pruning, sprays and spraying, thinning, harvesting and marketing. Associate Professor Wolff.

Required of Sophomores in Agriculture. 3 credits: 2 recitations; 1 laboratory.

4–b. **Viticulture and Small Fruit Culture.** A comprehensive study of the grape and small fruits, such as the strawberry, raspberry, blackberry, currant and gooseberry. Each fruit is studied with reference to its history, classification, propagation, planting, pruning, injurious insects and diseases, picking and marketing. Associate Professor Wolff.

Required in Horticultural course. 3 credits: 2 recitations; 1 laboratory.

5-a. **Systematic Pomology and Commercial Orcharding.** A study of fruit varieties with special reference to those adapted to New England conditions. Both tree and fruit characteristics are studied, and the student is required to recognize at sight the common varieties of fruits grown in this locality. In the laboratory special instruction is given in the packing of apples for market and in the judging of fruit. Professor Gourley.

Required of Seniors in Horticulture. 3 credits: 2 recitations; 1 laboratory.

6-b. **Advanced Pomology.** This subject deals with the management of commercial orchards, problems of marketing, transportation and co-operation. Special study is made of the experimental data which underlie orchard management. Professor Gourley.

Required of Seniors in Horticulture. 3 credits: 2 recitations; 1 laboratory.

7-c. **Landscape Gardening.** A study of the principles involved in ornamental and landscape gardening. Special attention is given to the beautifying of home surroundings. Laboratory work consists in landscape design and practice in laying out and planting home and public grounds. Assistant Professor Hepler.

Required of Juniors in Horticulture. 4 credits: 2 lectures; 1 recitation; 1 laboratory.

8-c. **Nursery Management.** A study of the methods of propagation and the care of trees, shrubs and perennial plants in the nursery. Lectures, reference readings and practice. Associate Professor Wolff.

Required of Juniors in Horticulture. 4 credits: 3 recitations; 1 laboratory.

9-b. **Floriculture.** A special study of the classification, history and development of the flowers and plants grown commercially and about the home, together with instruction and practice in their propagation and culture. Mr. Macfarlane.

Required of Juniors in Horticulture. 3 credits: 2 recitations; 1 laboratory.

10-c. **Evolution and Improvement of Plants.** The application of the principles of evolution to the improvement of plants. Variation, selection and heredity as applied to the problems of plant breeding in agricultural practice. Professor Gourley.

Required of Seniors in Horticulture and General Agriculture. 3 credits: 3 recitations.

11-b. **Vegetable Forcing.** A subject dealing with the study of special vegetables as grown under glass. Emphasis is placed upon the commercial phases of the work, including varieties, culture, style of

packages, and marketing. Each student is required to grow crops from seeding to maturity. In addition, a study of vegetable classification is given. Assistant Professor Hepler.

Required of Juniors in Horticulture. 3 credits: 1 lecture; 2 laboratories.

12-c. **Horticultural Seminar.** A review of the important horticultural literature and methods of investigational work. Professor Gourley.

Required of Seniors in Horticulture. 1 credit: 1 seminar meeting.

13-c. **Vegetable Gardening.** This subject takes up the problems of home and school gardening. It includes the study of methods of laying out and handling home, school and community gardens, choice of crops and varieties, their adaptation to local soil conditions, and the culture, displaying and judging of home garden vegetables. Assistant Professor Hepler.

Elective for women students. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

14-a. **Advanced Horticulture.** Special work in horticulture may be taken by arrangement with the head of the department. Professor Gourley.

Prerequisites will depend upon the work taken. Elective for Seniors in Horticulture and General Agriculture. 2 to 5 credits: 2 to 5 exercises.

15-b. **Advanced Horticulture.** A continuation of 14-a. Special arrangements for this work must be made with the head of the department. Professor Gourley.

Elective for Seniors in Horticulture and General Agriculture. Time and credit to be arranged: 2 to 5 exercises.

16-c. **Advanced Horticulture.** A continuation of 15-b. Special arrangements for this work must be made with the head of the department. Professor Gourley.

Elective for Seniors in Horticulture and General Agriculture. Time and credit to be arranged: 2 to 5 exercises.

POULTRY HUSBANDRY

ALTON W. RICHARDSON, *Associate Professor*

1-b. **Farm Poultry.** A general subject in poultry husbandry, taking up the origin and history of the breeds, housing, and general management. Associate Professor Richardson.

Required of Sophomores in Agriculture. 3 credits: 2 lectures; 1 laboratory.

2–c. **Farm Poultry.** A continuation of 1–b, taking up incubation, brooding, breeding, feeding, and marketing. Associate Professor Richardson.

Prerequisite: Poultry 1–b. Required of Sophomores in Agriculture. 3 credits: 2 lectures; 1 laboratory.

3–b. **Home Poultry for Girls.** A subject designed to aid in giving a practical knowledge of poultry to girls who are taking the course in Home Economics, and also to any girls in the Arts and Science courses who may be interested. Associate Professor Richardson

3 credits: 2 lectures; 1 laboratory.

4–c. **Home Poultry for Girls.** A continuation of 3–b. Associate Professor Richardson.

Prerequisite: Poultry 3–b. 3 credits: 3 lectures.

5–a. **Poultry Management.** A subject in poultry management in which the students lay out plans and make drawings for a 1,000-bird poultry plant, taking into consideration every phase of management. Associate Professor Richardson.

Elective for Juniors and Seniors. 3 credits: 3 lectures.

6–b. **Poultry Diseases.** A subject treating of the anatomy of the fowl, with clinics showing various common poultry diseases, and lectures giving methods of prevention and cure. The question of poultry sanitation and hygiene is also studied. Associate Professor Richardson.

Elective for Juniors and Seniors. 2 credits: 2 lectures.

7–c. **Incubation.** A study of the theories involved in incubation and brooding, with each student running an incubator, keeping records of fertility and hatchability, running the brooder, and keeping records of the mortality of the chicks. Associate Professor Richardson.

3 credits: 2 lectures; 1 laboratory.

8–a. **Poultry Seminar.** A seminar subject where each student studies various recent bulletins of important poultry topics, writes abstracts of them and delivers to the class an opinion on the bulletins in question. An opportunity for students to do research work in poultry husbandry. Associate Professor Richardson.

Elective for Juniors and Seniors. 3 credits: 3 lectures.

9–c. **Poultry Feeding.** A subject dealing with the principles of feeding and the comparative value of various feeds and grains used in poultry feeding. Each student will be obliged to feed a pen of hens and a brood of chicks, getting actual practice in manipulating an oat sprouter,

and doing all the feeding involved in the care of the hens and chicks. Associate Professor Richardson.

3 credits: 2 lectures; 1 laboratory.

10-a. **Poultry Breeding.** A subject giving the theories and practice involved in breeding for egg production and for feathers; practical work in selecting the breeding stock, with special consideration as to their utility. Associate Professor Richardson.

Elective for Juniors and Seniors. 2 credits: 2 lectures.

ARTS AND SCIENCE DIVISION

ERNEST R. GROVES, *Dean*

DEPARTMENTS

ECONOMICS
ENGLISH
GEOLOGY
HOME ECONOMICS
LANGUAGES
SOCIOLOGY
EDUCATION AND PSYCHOLOGY
HISTORY AND POLITICAL SCIENCE
METEOROLOGY AND ASTRONOMY
ZOÖLOGY

[ASTRONOMY—See page 122.]

ECONOMICS

MARION O'K. MCKAY, *Assistant Professor*
VICTOR W. BENNETT, *Instructor*

1–a. **The Principles of Economics.** This subject is designed to acquaint the student with the general principles of the science which deals with the activities of man in securing a living. Such topics as the following will receive attention: the characteristics of the present economic system; the evolution of economic society; production and consumption; value and exchange; value and price; money, credit and banking; international trade; protection and free trade; the kinds and nature of wealth; its distribution in the form of rent, wages, interest, and profits. In addition to the foregoing, certain selected economic problems, such as transportation, insurance, socialism and agricultural problems will be considered. The elements of public finance will receive some attention. Assistant Professor McKay.

Elective for Sophomores, Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

2–b. **The Principles of Economics.** A continuation of 1–a. Assistant Professor McKay.

Prerequisite: Economics 1–a. Elective for Sophomores, Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

3–c. **Industrial and Commercial Geography.** A survey of the facts and principles of industry and commerce, and a brief consideration of the commercial development of nations. Particular attention will be given to the importance of natural and physical conditions as determinants of commercial development. Ocean traffic and the more important trade routes will receive attention. The more important commodities of commerce, the regions of their production, and the markets to which

they are sent are studied. Finally, attention will be given to commerce and industry during the war, and to the steps taken since the close of the war looking towards commercial and industrial development. Assistant Professor McKay.

Elective for Freshmen and Sophomores. 3 credits: 1 lecture; 2 recitations.

4–a. **Labor Problems.** This subject will in the main be concerned with what may be called modern problems of organized labor. The background and the structure of labor organizations will be studied first. Thereafter attention will be directed to strikes and their causes, lock-outs, boycotts, the open and closed shop, arbitration, the trade agreement, restriction of membership and output, legislative methods, labor legislation, labor parties. Some attention will be given to labor problems in connection with the prosecution of the war. Lastly the American Federation of Labor, the Industrial Workers of the World, and Bolshevism will be considered. Assistant Professor McKay.

Economics 4–a and 7–a will be given alternate years. Economics 4–a will not be given in 1919–1920. Prerequisite: Economics 2–b. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

5–b. **Money and Banking.** A subject to acquaint the student with the principles and functions of money; the history of coinage in the United States; the money system in the United States; the value of money and prices; bi-metallism; credit; the origin and development of banking; the banking systems of England, France, Germany and Canada; the National Banking System of the United States; the Federal Reserve System; domestic and foreign exchange; savings banks; and trust companies. Assistant Professor McKay.

Prerequisite: Economics 2–b. Economics 5–b and 10–b will be given in alternate years. Economics 5–b will not be given in 1919–1920. 3 credits: 2 lectures; 1 recitation.

6–c. **Principles of Public Finance.** This subject aims to acquaint the student with the fundamental principles of public finance. A brief survey will be given of the enormous increases in the expenses of modern governments. The different methods of raising funds to meet the increasing expenses will be examined. Particular attention will be given to the theory and practice of taxation, recent reforms in taxation, war loans, and to taxation in New Hampshire. Assistant Professor McKay.

Prerequisite: Economics 2–b. The student is urged to take Economics 4–a before taking this subject. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

7–a. **Corporations.** The subject-matter of this subject deals with the general nature of business organization, the evolution and forms of

business organization; a study of selected typical business corporations; and finally, public policy towards the corporation and trust problems. The Sherman Act, the Clayton Act, and the Webb-Pomerence Law will be considered. Particular attention will be given to corporation finance. Assistant Professor McKay.

Prerequisite: Economics 2–b. The student is advised to take Economics 4–a before taking this subject. Economics 4–a and 7–a will be given in alternate years. Economics 7–a will be given in 1919–1920. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

8–c. **Rural Economics.** Attention will first be directed to the beginnings of agriculture and to its development especially in the United States. Next will be considered the factors of agricultural production, farm management, the distribution of the agricultural income, marketing, co-operative organization, the federal farm loan banks, and price fixing by federal authority. Assistant Professor McKay.

Required of Seniors in Agriculture. Elective for other Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

9–b. **Economic History of the United States.** This subject aims to give a general survey of the economic history of the United States. Some attention is given to the study of the Industrial Revolution in Europe. Other topics considered are: early industries in the American colonies, English colonial policy, commerce, transportation, currency and banking, population and labor, slavery, agricultural machinery, economic integration and industrial organization. Assistant Professor McKay.

Prerequisite: Economics 2–b. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

10–b. **Transportation.** This subject is concerned chiefly with the problems of railroad transportation in the United States. Particular attention is given to railroad finance and to federal control of the railroads during the recent war. Assistant Professor McKay.

Prerequisite: Economics 6–c. Elective for Juniors and Seniors. Economics 5–b and 10–b will be given in alternate years. Economics 10–b will be given in 1919–1920. 3 credits: 1 lecture; 2 recitations.

11–c. **Economic History of Modern Europe.** The purpose of this subject is to inquire into the origin, the nature and effects of the more important economic changes and achievements in Europe during the last three hundred years. Particular attention will be given to the more recent developments in Great Britain, France and Germany. Assistant Professor McKay.

Prerequisite: Economics 2–b. Elective for Juniors and Seniors. 3 credits: 3 recitations.

12–a. Business Accounting. A study of the fundamental principles of accounting, first in private or individual business, then the partnership, and closing with the corporation. Interpretation of accounts, business statements and records. The subject is intentionally made to cover a broad field in order that it may be of the greatest service to students from all three divisions, both men and women. Mr. Bennett.

Elective for Sophomores and Juniors in Arts and Science and for Seniors from all divisions. 3 credits: 2 recitations; 1 laboratory.

13–b. Business Accounting. A continuation of 12–a. Mr. Bennett.

Prerequisite: Economics 12–a. Elective for Sophomores and Juniors in Arts and Science and for Seniors from all divisions. 3 credits: 2 recitations; 1 laboratory.

14–c. Business Accounting. A continuation of 13–b. Mr. Bennett.

Prerequisite: Economics 13–b. Elective for Sophomores and Juniors in Arts and Science and for Seniors from all divisions. 3 credits: 2 recitations; 1 laboratory.

15–a. Cost-Accounting. The study of cost-accounting as it operates in a modern manufacturing concern. The student handles and becomes familiar with the best cost-keeping forms and records. Careful study is made of costs, especial attention being given to overhead expense or burden, including the problems of depreciation and idle factor time. Mr. Bennett.

Prerequisite: Economics 14–c. Elective for Sophomores and Juniors in Arts and Science and for Seniors from all divisions. 3 credits: 2 recitations; 1 laboratory.

16–b. Cost-Accounting. A continuation of 15–a. Mr. Bennett.

Prerequisite: Economics 15–a. Elective for Sophomores and Juniors in Arts and Science and for Seniors from all divisions. 3 credits: 2 recitations; 1 laboratory.

17–b. Advanced Accounting. Special study will be made of banking, corporation, and public utility accounting. This is largely a practical course making practical application of the theory of the previous subjects. The student will have an opportunity to select his specialty and will be given special work in that field. Mr. Bennett.

Prerequisite: Economics 14–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

18–c. Advanced Accounting Problems. A continuation of 17–b. Mr. Bennett.

Prerequisite: Economics 17–b. Elective for Juniors and Seniors.

19–b. Auditing Theory and Practice. Study of various kinds of audits, and their values; duties and responsibilities of the auditor; his report, certificates, etc. Special problems and model reports supplement the theory in the subject. Mr. Bennett.

Prerequisite: Economics 14–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

20–c. Auditing Theory and Practice. A continuation of 19–b. Mr. Bennett.

Prerequisite: Economics 19–b. 3 credits: 3 recitations.

EDUCATION AND PSYCHOLOGY

CHARLES L. SIMMERS, *Professor*

The training of teachers for high schools is recognized as one of the important functions of New Hamsphire College. In order to do this more adequately a Department of Education and Psychology has been established which has as its aims:

1. To offer prospective high school teachers, principals, and superintendents the necessary technical training for their profession.

2. To present educational history and educational problems in their more philosophic and scientific aspects so that they may be valuable to all college students preparing to become teachers.

To this end, it is expected that all students intending to teach will elect at least the following subjects in the Department of Education and Psychology, making a total of twenty term hours; Education 10–b, 11–c, 21–a, or 22–a and 28–c, and Psychology 1–b, 2–c and 24–b.

The prospective teacher should take either the general or Teacher Training course in Agriculture, the Manual Arts, or in Home Economics. If registered in the Arts and Science Division, he should major in the Department of Education, or elect a major and one or two minors in the several departments of the division. The aim should be to attain as intensive and extensive an education as possible during the four years spent in college.

The state of New Hampshire has accepted the provisions of the Smith-Hughes Act for training teachers of agriculture, home economics, and industrial education. New Hampshire College has been designated as the one state institution for the training of teachers in these subjects. Under the same Act New Hampshire has accepted federal money for the purpose of paying increased salaries in schools to be known as Smith-Hughes high schools. Students wishing to be prepared to teach in these schools should confer with the head of the Department of Education.

EDUCATION

10–b. Secondary Education. A systematic study of secondary school problems is made. Some of the topics considered are: value of scholar-

ship, qualities of the efficient teacher and his relation to the various elements of the school community, standards of professional conduct, school law, etc. Lectures, assigned readings and discussion. Professor Simmers.

Prerequisite: Psychology 2–c. Required of Juniors in Home Economics, Agriculture and Manual Arts. Junior subject. 2 credits: 2 recitations.

11–c. **Secondary Education.** A continuation of 10–b. Some of the topics are: broadening purposes of high-school instruction; how to manage the class; selection and arrangement of subject-matter; types of learning involved in high-school subjects; practice or drill; reflective thinking; training in expression, interest and learning; supervised study; conversational methods; laboratory methods; the art of questioning; lesson planning, etc. Each student is required to make systematic observations in schools near Durham. Lectures, assigned readings reports and discussion. Professor Simmers.

Prerequisite: Education 10–b. Required of Juniors in Home Economics, Agriculture and Manual Arts. Junior subject. 3 credits; 3 recitations.

20–a. **History and Principles of Vocational Education.** Some of the topics considered are: primitive industry and educational practice; industrial activity in the monasteries; the apprenticeship system; the Fellenberg Institute at Hoffwyl; the manual training, industrial, agricultural and home economics movements; vocational guidance, federal and state legislation concerning vocational education. Typical industrial, trade, evening, continuation, part time, home economics and agricultural schools will be studied. Lectures, assigned readings, and discussion. Professor Simmers.

Required of Seniors in Agriculture, Home Economics, and Manual Arts. Not open to other students. Senior subject. 3 credits: 3 recitations.

*21–a. **History of Education.** Before and during the Middle Ages. An attempt is made to show the relationship between the industrial, intellectual, social, philosophic, and religious ideals of the times, and the varying conceptions of aim, method, curricula, and organization of educational agencies. Lectures, assigned readings, and discussion. Professor Simmers.

Open only to Juniors and Seniors, except by permission. Senior subject. 3 credits: 3 recitations.

*22–a. **History of Education.** Modern Period. This subject is quite similar to Education 27–c in aim and method of treatment. It deals with the progress of society and related educational problems from

* Education 21–a and 22–a are given in alternate years. Education 21–a is given in 1919–1920.

the time of Comenius (beginning of seventeenth century) to the present time. It also attempts to show the origin and evolution of present theory and practice in education. Lectures, assigned readings and discussion. Professor Simmers.

Open only to Juniors and Seniors, except by permission. Senior subject. 3 credits: 3 recitations.

25–b. **Principles of Education.** In this subject a general background for educational thought and practice is sketched. The biological, psychological, social and ethical bases of education are considered. The aim is to give underlying principles and to show how they should function in the work of the grades and the high school. The subject is fundamental for those students intending to become principals or superintendents of schools. Lectures, assigned readings and discussion. Professor Simmers.

Prerequisite: Education 11–c. Senior subject. 3 credits: 3 recitations.

26–b. **The School Principalship.** The functions of the principal or head master, his relation to patrons, board of education, superintendent; discipline, grading, promotion, school law, teachers' meetings, educational measurements, school records, reports, etc. This subject should be elected by both men and women who wish to become principals of small school systems, and later, head masters. Those who elect this subject should have taken Psychology 2–c, Education 11–c, 21–a or 22–a, and should also take Psychology 24–b, Education 25–b, and 28–c. Also one or more subjects in "Special Methods in Education" (see page 107), should be taken. Lectures, assigned readings, reports, and discussion. Professor Simmers.

Senior subject. 2 credits: 2 recitations.

28–c. **School Hygiene.** The physical welfare of the pupil is considered in relation to his moral, social and intellectual development. Hygiene of play, study, work, daily programs, the selection of school-building site, heating, ventilation, medical inspection, communicable diseases, detection and treatment of defects of the senses, causes of fatigue and its relief and prevention, etc., are studied. Lectures, assigned readings and discussion. Professor Simmers.

Required of Seniors in Manual Arts, Home Economics and Agriculture. Senior subject. 3 credits: 3 recitations.

29–a–b–c. **Supervised Practice Teaching.** At some time during his senior year each student majoring in the Department of Education will be required to spend at least two weeks doing supervised practice teaching in the public high schools near Durham. The work will be

under the direction of the head of the Department of Education. Professor Simmers.

Open only to Seniors majoring in the Department of Education and Psychology. 2 or 3 credits.

Special Methods in:

1. Teaching Home Economics (see Home Economics 27–b).
2. Teaching Agriculture (see Agriculture 2–a).
3. Teaching Manual Arts (see Shop 26–a).
4. Teaching Mathematics (see Mathematics 13–a).
5. Teaching English (see English 17–a).

PSYCHOLOGY

1–b. Introduction to Psychology. A rapid survey of the physiological bases of human behavior is made. The nature of psychology, its scope and phases, the nervous system and the nature of its action, the various senses and their manner of functioning, habit, attention, etc., are studied. Lectures, assigned readings and quizzes are supplemented by simple laboratory demonstrations and experiments. Professor Simmers.

This subject must be taken also by those who elect other subjects in Psychology and Education. Sophomore subject. 3 credits: 3 recitations.

2–c. Introduction to Psychology. A continuation of 1–b. Perception, memory, reasoning, instinct, feeling, emotion, temperament, will, etc., are treated at length, in a practical and applied manner. Professor Simmers.

Prerequisite: Psychology 1–b. This subject must be taken also by those who elect other subjects in Psychology and Education. Sophomore subject. 3 credits: 3 recitations.

10–a. Elements of Psychology. As complete a study as possible is made of the psychology of the chief learning processes,—sensation, perception, memory, imagination, concept formation, reasoning, instinct, emotion and will. Professor Simmers.

Required of students in the Teacher Training courses in Home Economics, Agriculture and Manual Arts. Not open to other students. Junior subject. 3 credits: 3 recitations.

24–b. Psychology of the Adolescent. A study is made of the growth and development of the physical, psychic, intellectual, moral, social and religious nature of the adolescent boy and girl. The aim is to develop in the student a clearer insight into the nature of youth, particularly those of high school age, so that they can be dealt with in a more sympathetic and helpful manner. Lectures, assigned readings and discussion. Professor Simmers.

Prerequisite: Psychology 2–c or 10–a. Required of Seniors in Home Economics, Manual Arts and Agriculture. Senior subject. 3 credits: 3 recitations.

ENGLISH

ALFRED E. RICHARDS, *Professor*
CLARENCE W. SCOTT, *Professor*
HAROLD H. SCUDDER, *Associate Professor*
RUTH RICHARDSON, *Instructor*

1-a. **English Composition.** The chief aim of this subject is a thorough review of English grammar and syntax. Stress is laid also upon such fundamentals of written composition as punctuation, spelling, choice of words, and clearness of sentence structure. Short themes, both prepared and impromptu, and monthly reports upon outside reading are required. Professor Richards, Associate Professor Scudder, Miss Richardson.

Required of all Freshmen. 3 credits: 3 recitations.

2-b. **English Composition.** A continuation of 1-a. Professor Richards, Associate Professor Scudder, Miss Richardson.

Prerequisite: English 1-a. Required of all Freshmen. 3 credits: 3 recitations.

3-c. **English Composition.** A continuation of 2-b. This subject adds to the study of the principles of good writing, a training in literary appreciation. The characteristics of exposition, narration, description and argumentation are studied, and frequent themes illustrating these forms of composition are required. This work is supplemented by outside reading and monthly book reports. Professor Richards, Associate Professor Scudder, Miss Richardson.

Prerequisite: English 2-b. Required of all Freshmen. 3 credits: 3 recitations.

4-a. **Advanced Composition.** A study of English composition in respect to the technique of style, diction and literary form. The reading and discussion of essays by modern writers is supplemented by frequent themes, and by a study of oral English as a form of composition. Professor Richards.

Prerequisite: English 3-c. Required of Sophomores in Mechanic Arts. Elective for other Sophomores and Juniors. 3 credits: 3 recitations.

5-b. **Introduction to English Literature.** A general survey of English literature from its beginnings to the present day. To one who intends to teach English it is of fundamental importance. Lectures and recitations. Professor Richards.

Prerequisite: English 3-c. Elective for all classes. 3 credits: 3 recitations.

6-c. **Writing for Publication.** A practical study of the preparation of articles for the newspapers and magazines. It is for all whose voca-

tion will demand frequent writing for publication, and a preparation in part for those who intend to take up newspaper work after graduation. It does not cover the entire field of journalism, but the student will be instructed in the duties of a reporter and be given constant practice in writing news stories. Associate Professor Scudder.

Prerequisite: English 3–c. Elective for those who have attained a grade of "C" or higher in English 3–c. 3 credits: 3 recitations.

7–c. **Public Speaking.** A study of the principles and practice of public speaking, including debate. Each student acquires practice in both prepared and impromptu speaking upon topics of the day and subjects of educational value. Professor Richards.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

8–b. **History of the English Drama.** A survey of the English drama from its beginnings to the Closing of the Theatres. Constant reading of the plays with written criticisms and reports is required. Associate Professor Scudder.

Prerequisite: English 3–c. Elective for Sophomores, Juniors and Seniors. 3 credits: 3 lectures.

9–a. **The English Novel in the Nineteenth Century.** A study of the novel from Jane Austen to Thomas Hardy. There will be lectures, recitations and constant outside reading. Associate Professor Scudder.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

10–a. **American Literature.** Lectures and extensive outside reading. Professor Scott.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

11–b. **American Literature.** A continuation of 10–a. Professor Scott.

Elective for Juniors and Seniors. 3 credits: 3 recitations.

12–c. **American Literature.** A continuation of 11–b. Professor Scott.

Elective for Juniors and Seniors. 3 credits: 3 recitations.

13–b. **English Poetry.** A study of English poetry written between 1798 and 1918. Professor Richards.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

14–a. Shakespeare's Plays. A study of the principal plays of Shakespeare. Recitations and occasional dramatic representations of famous scenes. A large amount of reading required. Professor Richards.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

15–b. Comparative Study of the Drama. Reading of selected dramas from Greek, Latin, Spanish, French, Italian, German and Danish literature; from Aeschylus to Ibsen. English drama excluded. Constant reading, written criticisms and reports required. Miss Richardson.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

16–c. American Drama. A study of American drama, covering the period beginning with Thomas Godfrey's *Prince of Parthia*, 1767, and ending with plays of recent date. Miss Richardson.

Prerequisite: English 15–b. Elective for Juniors and Seniors. 3 credits: 3 recitations.

17–a. The Teaching of High School English. This subject is especially designed for those who major in English. It is the study and application of methods of teaching oral and written composition, poetry, prose fiction, the essay, drama and oration. Attention is given to outside reading, the school paper, dramatics and other aids to the teaching of English. Miss Richardson.

Prerequisite: English 4–a, and Education 2–b. Elective for Seniors. 3 credits: 3 recitations.

18–b. History of the Language. The object of this study is to give the student an intelligent appreciation of the English language as it has developed from its origin to the oral and written speech of today. Lectures, recitations and outside reading will constitute the work of the term. Professor Richards.

Prerequisite: English 3–c and 4–a. Elective for Seniors. 3 credits: 3 recitations.

19–c. History of the Language. A continuation of 18–b. Professor Richards.

Prerequisite: English 18–b. Elective for Seniors. 3 credits: 3 recitations.

20–c. The Essay. A study of the essay as represented in the writings of Lamb, Newman, Ruskin, Hazlitt, Harrison, and as employed by the leaders in the literary and scientific world of today. Professor Richards.

Prerequisite: English 4–a. Elective for Seniors. 3 credits: 3 lectures.

GEOLOGY

C. Floyd Jackson, *Professor*
Mr. —— ——, *Instructor*

1-a. **Elementary Geology.** A detailed study of the evolution of the earth, with special emphasis on the dynamic factors responsible for its present surface configuration. Local conditions will be studied, with reference to the factors of erosion, transportation and consolidation. Origin and distribution of economic mineral products will be discussed. Professor Jackson.

Required of Juniors in Agriculture. Elective for other Juniors and Seniors. 3 credits: 3 recitations.

2-c. **Historical Geology.** A detailed study of the history of various groups of animals, as recorded in the rocks of the earth's surface. Special attention will be given to the phylogenetic development of the vertebrates. Recitations, lectures and written reports required. Professor Jackson.

Prerequisites: Zoölogy 3-c, or 32-c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

100-b. **Clay Products and Building Stones.** A study of the origin and distribution of building stones and clay products with special reference to their economic importance. Laboratory work will consist of the examination and testing of samples. Tests and microscopical examinations will be made with an attempt to determine their resistance to weathering, etc. Professor Jackson.

Open only to Juniors in Architectural Construction. 2 credits: 1 lecture; 1 laboratory.

HISTORY AND POLITICAL SCIENCE

Clarence W. Scott, *Professor*
Donald C. Babcock, *Assistant Professor*

HISTORY

In the subjects in history an important place is given to historical reading carried on in the reference room. In some cases a considerable part of the work is written.

1-a. **History of Europe from 476 to 1300.** Recitations and collateral reading. Professor Scott.

Elective for Freshmen in Arts and Science and Juniors in Mechanic Arts. 3 credits: 3 recitations.

2-b. **History of Europe from 1300 to 1492.** Recitations and collateral reading. Professor Scott.

Elective for Freshmen in Arts and Science and Juniors in Mechanic Arts. 3 credits: 3 recitations.

3–c. **History of Europe from 1492 to 1700.** Recitations and collateral reading. Professor Scott.

Elective for Freshmen in Arts and Science and Juniors in Mechanic Arts. 3 credits: 3 recitations.

4–a. **History of Europe from 1700 to 1815.** Recitations and collateral reading. Assistant Professor Babcock.

Prerequisite: History 3–c. Elective for Sophomores. 3 credits: 3 recitations.

5–b. **History of Europe from 1815 to 1871.** Recitations and collateral reading. Assistant Professor Babcock.

Prerequisite: History 4–a. Elective for Sophomores. 3 credits: 3 recitations.

6–c. **History of Europe since 1871.** Recitations and collateral reading. Assistant Professor Babcock.

Prerequisite: History 5–b. Elective for Sophomores. 3 credits: 3 recitations.

7–a. **American History to 1783.** With special reference to the political and constitutional development of the colonies. Assistant Professor Babcock.

Elective for Juniors in Arts and Science and Seniors in Mechanic Arts. 3 credits: 3 recitations.

8–b. **Political and Constitutional History of the United States from 1781 to 1829.** Assistant Professor Babcock.

Elective for Juniors in Arts and Science and Seniors in Mechanic Arts. 3 credits: 3 recitations.

9–c. **Political and Constitutional History of the United States from 1829 to 1861.** Assistant Professor Babcock.

Elective for Juniors in Arts and Science and Seniors in Mechanic Arts. 3 credits: 3 recitations.

10–a. **Political and Constitutional History of the United States from 1861 to 1880.** Assistant Professor Babcock.

Prerequisite: History 9–c. Elective for Seniors. 3 credits: 3 recitations.

11–b. **Political and Constitutional History of the United States since 1880.** Assistant Professor Babcock.

Prerequisite: History 10–a. Elective for Seniors. 3 credits: 3 recitations.

12–a. **Political and Constitutional History of England to 1485.** Assistant Professor Babcock.

3 credits: 3 recitations.

13-b. Political and Social History of England from 1485 to 1714. Assistant Professor Babcock.

3 credits: 3 recitations.

14-c. Political and Social History of England since 1714. Assistant Professor Babcock.

3 credits: 3 recitations.

POLITICAL SCIENCE

1-a. Laws of Business. Recitations, supplemented by the discussion of cases. Professor Scott.

Elective for Sophomores in Arts and Science, Juniors and Seniors in Mechanic Arts, and Seniors in Agriculture. 3 credits: 3 recitations.

2-b. American Constitutional Law. Recitations, supplemented by a study of the decisions of the United States Supreme Court. Special attention is given to the connection between American constitutions and American political history. Professor Scott.

Elective for Juniors and Seniors in Arts and Science and Mechanic Arts, and Seniors in Agriculture. 3 credits: 3 recitations.

3-c. International Law. Recitations and collateral work. Emphasis is placed on current events and recent developments in world organization. Assistant Professor Babcock.

3 credits: 3 recitations.

4-c. The State. The development of government from early forms; the government of modern European states. Recitations and collateral reading. Assistant Professor Babcock.

3 credits: 3 recitations.

5-b. Civics. A study of the functions, principles and organization of the American Government. Mr. Bennett.

3 credits: 3 recitations.

6-c. Citizenship. A course in civil government and civic responsibility. Assistant Professor Babcock.

3 credits: 3 recitations.

HOME ECONOMICS

Louise Knight, *Assistant Professor and Acting Head of Department*
Frieda Reiner, *Assistant Professor*
Arabella S. Livingston, *Instructor*
Bernice Smith, *Instructor*

1-a. Elementary Clothing. The fundamental principles of hand and machine sewing used in household linens and undergarments. Ele-

mentary drafting, cutting and fitting, applied to the making of undergarments, comparing the costs to those of ready-to-wear garments. Darning and mending. Students provide all material subject to the approval of the instructor. Miss Livingston.

Required of Freshmen in Home Economics Teacher Training course. 2 credits: 2 laboratories; 2 outside hours.

2–b. **Elementary Clothing.** A continuation of 1–a. Miss Livingston.

Prerequisite: Home Economics 1–a. 2 credits: 2 laboratories; 2 outside hours.

3–c. **Textiles and Weaving.** The textile fibres; their sources, production and uses; study of their physical and chemical properties; examination of the fibres and of woven fabrics. Judging of fabrics for personal and household purposes, considering the relative costs, durability and suitability. Miss Livingston.

Prerequisite: Chemistry 7–b; and 8–c taken as a parallel course. Required of Freshmen in Home Economics. Expense for trips about $4. 3 credits: 1 recitation; 2 laboratories.

4–a. **Foods and Principles of Cookery.** The history, manufacture, production, composition, selection and cost of foods. Principles of cookery applied to preservation and preparation of food, stressing the economic use and combinations of food in serving. Miss Reiner.

Prerequisites: Chemistry 8–c; Physics 5–b. Required of Sophomores in Home Economics. 4 credits: 2 lectures; 2 laboratories.

5–b. **Foods and Principles of Cookery.** A continuation of 4–a. Miss Reiner.

Prerequisite: Home Economics 4–a. Required of Sophomores in Home Economics. 4 credits: 2 lectures; 2 laboratories.

6–c. **Foods and Principles of Cookery.** A continuation of 5–b. Miss Reiner.

Prerequisite: Home Economics 5–b. Required of Sophomores in Home Economics. 4 credits: 2 lectures; 2 laboratories.

7–a. **Food Preparation.** This subject is to give a general knowledge of the processes of cookery. Miss Reiner.

Open to Sophomores, Juniors and Seniors not majoring in Home Economics. It does not satisfy prerequisites for any other subjects except Home Economics 8–b. 2 credits: 1 lecture; 1 laboratory.

8–b. Foods and Dietetics. A continuation of 7–a, stressing the dietetic value of foods. Miss Reiner.

Prerequisite: Home Economics 7–a. Open to Sophomores, Juniors and Seniors not majoring in Home Economics. It does not satisfy prerequisites for any other cookery subjects except Home Economics 9–c. 2 credits: 1 lecture; 1 laboratory.

9–c. Foods and Serving. A continuation of 8–b; and giving practice in preparing and serving meals. Miss Reiner.

Prerequisite: Home Economics 8–b. Open to Sophomores, Juniors and Seniors not majoring in Home Economics. It does not satisfy prerequisites for any other cookery subjects. 2 credits: 2 laboratories.

10–a. General Sewing. A subject in sewing opened to those not in the Home Economics course. The problems are individual but the sequence of them is planned with the instructor. Suggested projects are wash dress, wool skirt, wool dress, silk waist, tailored waist, middy. Miss Livingston.

Open to Sophomores, Juniors and Seniors. 3 credits: 1 lecture; 2 laboratories.

11–c. Drafting and Elementary Dressmaking. Practice given in drafting, cutting, fitting and designing of patterns; alteration and use of commercial patterns with application of these principles to the making of a cotton dress and a wool skirt. Students provide all materials subject to the approval of the instructor. Miss Livingston.

Prerequisites: Home Economics 2–b and 3–c; Drawing 24–b; Drawing 25–c. Required of Sophomores in Home Economics Teacher Training course. 3 credits: 3 laboratories; 2 hours outside.

12–a. Millinery. Designing and construction of frames; use of different materials in covering frames; making and placing of trimmings; renovating of materials and remodeling and trimming of old hats. All materials provided by students subject to the instructor's approval. Miss Livingston.

Elective for all Junior and Senior women. 2 credits: 2 laboratories.

13–a. Advanced Cookery. Comparative experimental work; modification of recipes; use of different temperatures, fats, leavening agents, and processes, with opportunity to judge results as a basis for scientific food preparation. Miss Reiner.

Prerequisites: Home Economics 6–c; Zoölogy 35–c. Required of Juniors in Home Economics. 2 credits: 2 laboratories.

14-b. **Physiological Chemistry.** This subject includes the study of the chemistry of cell structure and nutrition, and is the basis for a deeper and broader study of Nutrition and Dietetics. Miss Knight.

Prerequisites: Home Economics 13-a; Chemistry 16-b. Required of Juniors in Home Economics in the Dietitian course.

15-b. **Principles of Human Nutrition.** Composition of the body; its relation to the physical universe. The composition, digestion, absorption, assimilation and oxidation of food stuffs. The physiological fuel value of food stuffs. Methods of investigation employed in the study of human nutrition. The food requirements of the body as influenced by activity, size, age, sex. Problems throughout the term. It is hoped that a trip to Boston may be included. Cost about $5. Miss Reiner.

Prerequisites: Home Economics 9-a; Chemistry 15-a; and Chemistry 16-b as parallel subject; Zoölogy 35-c. Required of Juniors in Home Economics. 3 credits: 3 recitations.

16-c. **Nutrition and Dietetics.** Continuation of 15-b. Problems in dietary calculations. Comparative physiological values of foods. Application of the principles of human nutrition in the adaptation of diet to varying physiological, social and economic conditions. Miss Reiner.

Prerequisite: Home Economics 15-b. Required of Juniors in Home Economics. 3 credits: 2 recitations; 1 laboratory.

17-b. **Intermediate Dressmaking.** Middy blouse; a silk waist; a made-over problem. This last is to be the renovating and remodeling of a suit or dress into a one-piece dress, or the remodeling of a waist and skirt. All materials provided by the student subject to the instructor's approval. Miss Livingston.

Prerequisite: Home Economics 11-c. Required of Juniors in Home Economics Teacher Training course. 3 credits: 2 laboratories; 2 hours outside.

18-c. **Draping and Advanced Dressmaking.** The first problem is the designing, pattern modeling, cutting, fitting and draping on the dress form of an afternoon or party dress. Second problem,—lingerie waist, applying principles of hand sewing. Students provide all materials, subject to the approval of the instructor. Miss Livingston.

Prerequisite: Home Economics 17-b. Elective only for Juniors in Home Economics who have the approval of the instructor as qualified to carry the work. 4 credits: 2 laboratories; 4 hours outside.

19–c. **House Decoration.** Application of theory of color and of design in house decoration. Selection of house furnishings; study of values; estimation of costs, and comparisons of sanitary and artistic furnishings. Miss Reiner.

Prerequisite: Drawing 25–c. Required of Juniors in Home Economics Teacher Training and Home Economics Institutional courses. 2 credits: 2 recitations.

20–c. **House Management.** A study of the organization of the home, of the principle involved in the care and management of it, in systematic methods of housekeeping, and in the apportionment of the income. Miss Knight.

Required of Juniors in Home Economics. 3 credits: 2 lectures; 1 laboratory.

21–a. **Home Nursing.** Scientific care of the patient under home conditions. Observation of symptoms. First aid. Mrs. Smith.

Prerequisite: Zoölogy 35–c. Required of Seniors in Home Economics Teacher Training course. 2 credits: 1 lecture; 1 laboratory.

22–a–b. **Practice House.** In this subject the actual work of carrying on a home is done in the Practice House under supervision. The girls in a family size group, approximately six, live in the house for a term of six weeks. Each resident student in rotation serves in the capacity of the different members of the family. As hostess the girl assumes all duties of the mother in planning, buying, preparing and serving the meals. The regular college work is carried during the time the girls are in the house. Miss Knight.

Prerequisites: Home Economics 20–c. Required of Seniors in Home Economics Teacher Training course. 3 credits.

24–a. **Institutional Management.** A study of the feeding of institutional groups, considering institutional equipment, organization, and laundering; buying, planning, preparing and serving of meals; methods of keeping records. Laboratory practice will be given in the College Commons. Expenses for trips approximately $10. Mrs. Smith.

Prerequisite: Home Economics 16–c. This subject is required of Seniors in Home Economics Institutional and Dietitian's courses. 4 credits: 2 lectures; 2 laboratories.

25–b. **Institutional Management.** Continuation of 24–a. Mrs. Smith.

Prerequisite: Home Economics 24–a. 4 credits: 2 lectures; 2 laboratories.

26–c. **Institutional Practice.** Nine weeks of practical work will be given in institutions of different types, such as cafeteria, dormitories,

etc. Students specializing in dietetics will be placed in hospitals as student dietitians.

Prerequisite: Home Economics 25–b. Required of Seniors in Home Economics Institutional and Home Economics Dietitian courses. 8 or 9 credits.

27–b. Special Methods. Teaching of Home Economics in elementary and secondary schools. Consideration of the place of Home Economics in education, study of the content and organization of courses, of text books, references, and equipment in cookery and clothing laboratories. Planning of courses of study and of lesson plans. Observation and discussion of classes. Miss Knight.

Prerequisite: Education 20–a. Required of Seniors in Home Economics Teacher Training course and open only to students in this course. 3 credits: 3 recitations.

28–c. Practice Teaching. Application of the principles of the Special Methods course. The work is done for a prescribed period, of approximately nine weeks, in high school Home Economics classes and under the supervision of the Special Methods teacher. Miss Knight.

Prerequisite: Home Economics 27–b. Required of Seniors in Home Economics Teacher Training course and open only to students in this course. 9 credits.

LANGUAGES

RICHARD WHORISKEY, *Professor*
JAMES H. MARCEAU, *Assistant Professor*
RUTH RICHARDSON, *Instructor*

FRENCH

1–a. Elementary French. Elements of French Grammar. Reading of simple stories; conversation and dictation. Assistant Professor Marceau.

3 credits: 3 recitations.

2–b. Elementary French. A continuation of 1–a. Assistant Professor Marceau.

Prerequisite: French 1–a. 3 credits: 3 recitations.

3–c. Elementary French. A continuation of 2–b. Assistant Professor Marceau.

Prerequisite: French 2–b. 3 credits: 3 recitations.

4–a. French Prose. Reading and translation; composition; outside reading. Professor Whoriskey, Assistant Professor Marceau.

Prerequisite: French 3–c. Freshmen who have offered French for admission are allowed to take French 4–a, French 5–b and French 6–c. 3 credits: 3 recitations.

5–b. **French Prose.** A continuation of 4–a. Professor Whoriskey and Assistant Professor Marceau.

Prerequisite: French 4–a. 3 credits: 3 recitations.

6–c. **French Prose.** A continuation of 5–b. Professor Whoriskey and Assistant Professor Marceau.

Prerequisite: French 5–b. 3 credits: 3 recitations.

*7–a. **French Literature of the Nineteenth Century.** Selections from Hugo, Balzac, Sand, Dumas père, Daudet, Gautier. Composition. Assistant Professor Marceau.

Prerequisite: French 6–c. 3 credits: 3 recitations.

*8–b. **French Literature of the Nineteenth Century.** A continuation of 7–a. Assistant Professor Marceau.

Prerequisite: French 7–a. 3 credits: 3 recitations.

*9–c. **French Literature of the Nineteenth Century.** A continuation of 8–b. Assistant Professor Marceau.

Prerequisite: French 8–b. 3 credits: 3 recitations.

*10–a. **French Literature of the Seventeenth Century.** Lives and works of the following: Corneille; Racine; Moliére; Bossuet; Boileau; Mme. de Sévigné; La Fontaine. Composition. Assistant Professor Marceau.

Prerequisite: French 9–c. 3 credits: 3 recitations.

*11–b. **French Literature of the Seventeenth Century.** A continuation of 10–a. Assistant Professor Marceau.

Prerequisite: French 10–a. 3 credits: 3 recitations.

*12–c. **French Literature of the Seventeenth Century.** A continuation of 11–b. Assistant Professor Marceau.

Prerequisite: French 11–b. 3 credits: 3 recitations.

13–a. **French Composition and Conversation.** Assistant Professor Marceau.

Prerequisite: French 3–c. Recommended for those desiring to teach. 3 credits: 3 recitations.

14–b. **French Composition and Conversation.** A continuation of 13–a. Assistant Professor Marceau.

Prerequisite: French 13–a. Recommended for those desiring to teach. 3 credits: 3 recitations.

*French 10–a, 11–b and 12–c will be given in 1919–1920 and in alternate years with French 7–a, 8–b and 9–c.

15–c. **French Composition and Conversation.** A continuation of 14–b. Assistant Professor Marceau.

Prerequisite: French 14–b. Recommended for those desiring to teach. 3 credits: 3 recitations.

SPANISH

1–a. **Elementary Spanish.** Elements of Spanish grammar. Reading of simple stories; conversation and dictation. Miss Richardson.

3 credits: 3 recitations.

2–b. **Elementary Spanish.** A continuation of 1–a. Miss Richardson.

Prerequisite: Spanish 1–a. 3 credits: 3 recitations.

3–c. **Elementary Spanish.** A continuation of 2–b. Miss Richardson.

Prerequisite: Spanish 2–b. 3 credits: 3 recitations.

4–a. **Spanish Prose.** Reading and translation, conversation, composition. Miss Richardson.

Prerequisite: Spanish 3–c. 2 credits: 2 recitations.

5–b. **Spanish Prose.** A continuation of 4–a. Miss Richardson.

Prerequisite: Spanish 4–a. 2 credits: 2 recitations.

6–c. **Spanish Prose.** A continuation of Spanish 5–b. Miss Richardson.

Prerequisite: Spanish 5–b. 2 credits: 2 recitations.

7–a. **Third-Year Spanish.** Readings from Cervantes, Calderon and other Spanish authors. Review of grammar. Dictation and composition, with emphasis on commercial usages. Miss Richardson.

Prerequisite: Spanish 6–c. 2 credits: 2 recitations.

8–b. **Third-Year Spanish.** A continuation of 7–a. Miss Richardson.

Prerequisite: Spanish 7–a. 2 credits: 2 recitations.

9–c. **Third-Year Spanish.** A continuation of 8–b. Miss Richardson.

Prerequisite: Spanish 8–b. 2 credits: 2 recitations.

GERMAN

1–a. **Elementary German.** Elements of German grammar. Reading of simple stories. Professor Whoriskey.

Required of Freshmen in Chemical Engineering who have not offered German for admission. 3 credits: 3 recitations.

2–b. Elementary German. A continuation of 1–a. Professor Whoriskey.

Prerequisite: German 1–a. Required of Freshmen in Chemical Engineering who have not offered German for admission. 3 credits: 3 recitations.

3–c. Elementary German A continuation of 2–b. Professor Whoriskey.

Prerequisite: German 2–b. Required of Freshmen in Chemical Engineering who have not offered German for admission. 3 credits: 3 recitations.

4–a. German Prose. Reading and translation. Professor Whoriskey.

Prerequisite: German 3–c or its equivalent. Freshmen who have offered German for admission are allowed to take German 4–a, 5–b, and 6–c. Required of Sophomores in Chemical Engineering. 3 credits: 3 recitations.

5–b. German Prose. A continuation of 4–a. Professor Whoriskey.

Prerequisite: German 4–a. Required of Sophomores in Chemical Engineering.

6–c. German Prose. A continuation of 5–b. Reading and translation of Hauff's Lichtenstein and similar books. Professor Whoriskey.

Prerequisite: German 5–b. 3 credits: 3 recitations.

***7–a. Goethe.** His life and works. The following books are read and criticized: 1. Hermann und Dorothea; 2. Iphigenie; 3. Torquato Tasso; 4. Egmont; 5. Götz von Berlichingen; 6. Dichtung u. Wahrheit (in part); 7. Die Leiden des jungen Werters; 8. Faust, Part I. Professor Whoriskey.

Prerequisite: German 6–c. 3 credits: 3 recitations.

***8–b. Goethe.** A continuation of 7–a. Professor Whoriskey.

Prerequisite: German 7–a. 3 credits: 3 recitations.

***9–c. Goethe.** A continuation of 8–b. Professor Whoriskey.

Prerequisite: German 8–b. 3 credits: 3 recitations.

***10–a. Schiller.** His life and works. The following books are read and criticized: 1. Wilhelm Tell; 2. Maria Stuart; 3. Die Jungfrau; 4. Die Braut von Messina; 5. Wallenstein; 6. Don Carlos; 7. Geschichte d. 30 jährigen Krieges; 8. Ballads. Professor Whoriskey.

Prerequisite: German 6–c. 3 credits: 3 recitations.

***11–b. Schiller.** A continuation of 10–a. Professor Whoriskey.

Prerequisite: German 10–a. 3 credits: 3 recitations.

*German 10–a, 11–b, 12–c were given in 1918–1919; German 13–a, 14–b and 15–c will be given in 1919–1920 and German 7–a, 8–b and 9–c in 1920–1921.

*12-c. **Schiller.** A continuation of 11-b. Professor Whoriskey.

Prerequisite: German 11-b. 3 credits: 3 recitations.

*13-a. **Sudermann.** The following books are read and criticized: 1. Frau Sorge; 2. Der Katzensteg; 3. Teja; 4. Heimat; 5. Johannes; 6. Frenssen's Jörn Uhl. Professor Whoriskey.

Prerequisite: German 6-c. 3 credits: 3 recitations.

*14-b. **Sudermann and his Contemporaries.** A continuation of 13-a. Professor Whoriskey.

Prerequisite: German 13-a. 3 credits: 3 recitations.

*15-c. **Sudermann and his Contemporaries.** A continuation of 14-b.

Prerequisite: German 14-b. 3 credits: 3 recitations.

*16-c. **Scientific German.** Professor Whoriskey.

Required of Sophomores in Chemical Engineering. 3 credits: 3 recitations.

LATIN

1-a. **Livy (Book I).**

Elective for students who have offered Advanced Latin for entrance. 3 credits: 3 recitations.

2-b. **Livy (Book I).** A continuation of Latin 1-a.

Prerequisite: Latin 1-a. 3 credits: 3 recitations.

3-c. **Horace (Odes and Epodes).**

Prerequisite: Latin 1-a. 3 credits: 3 recitations.

METEOROLOGY AND ASTRONOMY

CHARLES H. PETTEE, *Professor*

1-b. **Meteorology.** Lectures and quizzes on wind systems, precipitation, humidity, laws of storms and tornadoes, and methods of prediction of atmospheric changes. Professor Pettee.

Prerequisite: Physics 2. Required of Seniors in Agriculture. 3 credits: 2 lectures; 1 recitation.

1-a. **Astronomy.** A short cultural subject designed to give the student a simple explanation of the many phenomena constantly exhibiting themselves in the universe and to acquaint him with the present state of astronomic science. Professor Pettee.

Elective for Juniors and Seniors. 3 credits: 3 recitations.

[POLITICAL SCIENCE—see Department of History and Political Science, page 111.]

* German 12-c was given in 1918-1919; German 13-a, 14-b and 15-c will be given in 1919-1920.

SOCIOLOGY

ERNEST R. GROVES, *Professor*
VICTOR W. BENNETT, *Instructor*

1-a. **Introduction to Sociology.** The nature of society, its laws, organizations and principles of progress. Mr. Bennett.

Elective for Sophomores. 3 credits: 3 recitations.

2-c. **Urban Community Sociology.** A study of the social history of urban civilization, with special emphasis upon the problems and progress of American cities. Recitations and reports. Mr. Bennett.

Elective for Sophomores. 3 credits: 3 recitations.

3-a. **Social Pathology and Modern Philanthropy. Poverty.** The study of causes of poverty, its relief and the contemporary problems related to it as reported in "The Survey." Professor Groves.

Elective for Juniors. 3 credits: 3 recitations.

4-b. **Social Pathology and Modern Philanthropy. Crime.** The study of the causes of crime, its treatment and the contemporary problems related to it as reported in "The Survey." Professor Groves.

Elective for Juniors. 3 credits: 3 recitations.

5-c. **Rural Community Sociology.** A study of the social significance, conditions and resources of American country life with the purpose of developing community leadership. Lectures and recitations. Professor Groves.

Elective for Juniors. 3 credits: 3 recitations.

6-a. **Evolution of Social Altruism.** A study of the history of social idealism among the English-speaking peoples. Lectures and reports. Professor Groves.

Prerequisites: Any three subjects in Sociology. Elective for Seniors. 3 credits: 3 recitations.

7-b. **An Introduction to General Sociology.** An advanced subject in the principles of sociology which aims to introduce the student to a systematic sociological interpretation of human association. A seminar course. Professor Groves.

Prerequisites: Any four subjects in Sociology. Elective for Seniors. 3 credits: 3 recitations.

8-c. **Sociological Research.** This subject provides the student opportunity for individual investigations of sociological problems. Problems. Reports. Professor Groves.

Prerequisites: Any five subjects in Sociology. Elective for Seniors. 3 credits: 3 recitations.

[PSYCHOLOGY—See department of Education and Psychology—page 104.]

ZOÖLOGY

C. Floyd Jackson, *Professor*
Alma Drayer Jackson, *Instructor*
—— ——, *Instructor*

Courses in the Department of Zoölogy are divided as follows:

Group A is primarily for Arts and Science students, pre-medical students and those majoring in Zoölogy. Students from other courses may, however, elect from this group, provided they have the proper prerequisites.

Group B includes the required courses in Agriculture and Home Economics, as well as certain other electives for either Agriculture, Home Economics or Arts and Science students.

Group A. Arts and Science Subjects

1–a. **Principles of Zoölogy.** An elementary study of the principles of life, its development, structural basis and physiological activity. The subject is continuous throughout the year. This subject is intended to give a practical knowledge of animal life and is required of all pre-medical students and others intending to major in the Department of Zoölogy. Students are strongly advised to carry the laboratory work (Zoölogy 4–a, 5–b, and 6–c) parallel with this subject. Professor Jackson.

3 credits: 3 lectures.

2–b. **Principles of Zoölogy.** A continuation of 1–a. Professor Jackson.

Prerequisite: Zoölogy 1–a. Elective for Freshmen. 3 credits: 3 lectures.

3–c. **Principles of Zoölogy.** A continuation of 2–b. Professor Jackson.

Prerequisite: Zoölogy 2–b. Elective for Freshmen. 3 credits: 3 lectures.

4–a. **Elementary Laboratory.** Laboratory exercises for the purpose of demonstrating the principles discussed in Zoölogy 1–a, 2–b and 3–c. A much clearer conception of life phenomena will be gained if the laboratory work is carried parallel to the lectures. Professor Jackson.

Prerequisite: Zoölogy 1–a, carried as a parallel subject. Required of all students majoring in Zoölogy. Elective for Freshmen. 1 credit: 1 laboratory.

5–b. **Elementary Laboratory.** A continuation of 4–a. Professor Jackson.

Prerequisite: Zoölogy 4–a; and Zoölogy 2–b, carried as a parallel subject. Elective for Freshmen. 1 credit: 1 laboratory.

6–c. Elementary Laboratory. A continuation of 5–b. Professor Jackson.

Prerequisites: Zoölogy 5–b; and Zoölogy 3–c, carried as a parallel subject. Elective for Freshmen. 1 credit: 1 laboratory.

7–a. Comparative Physiology. A detailed study of human anatomy and physiology, compared briefly with the anatomy and physiology of lower animals. This subject is intended to give a practical knowledge of the human mechanism and its method of operation. Students are strongly advised to carry the laboratory work (Zoölogy 10–a, 11–b and 12–c) parallel with this subject. Professor Jackson.

Prerequisite: Zoölogy 3–c. Required of all pre-medical students. Elective for Sophomores. 3 credits: 3 lectures.

8–b. Comparative Physiology. A continuation of 7–a. Professor Jackson.

Prerequisite: Zoölogy 7–a. Elective for Sophomores. 3 credits: 3 lectures.

9–c. Comparative Physiology. A continuation of 8–b. Professor Jackson.

Prerequisite: Zoölogy 8–b. Elective for Sophomores. 3 credits: 3 lectures.

10–a. Physiological Laboratory. Laboratory exercises for the purpose of demonstrating the principles in Comparative Physiology (Zoölogy 7–a, 8–b and 9–c). The laboratory work should be carried parallel with the lectures when possible. Professor Jackson and Mr. ——.

Prerequisite: Zoölogy 7–a, carried as a parallel subject. Elective for Sophomores. 1 credit: 1 laboratory.

11–b. Physiological Laboratory. A continuation of 10–a. Professor Jackson and Mr. ——.

Prerequisites: Zoölogy 10–a; and Zoölogy 8–b, carried as a parallel subject. Elective for Sophomores. 1 credit: 1 laboratory.

12–c. Physiological Laboratory. A continuation of 11–b. Professor Jackson and Mr. ——.

Prerequisites: Zoölogy 11–b; and Zoölogy 9–c, carried as a parallel subject. Elective for Sophomores. 1 credit: 1 laboratory.

13–a. Hygiene and Sanitation. A detailed study of the principles of health preservation. This subject is continuous throughout the year and should, if possible, be preceded by work in Physiology, although that subject is not a prerequisite. Professor Jackson.

Prerequisite: Zoölogy 3–c. Elective for Sophomores and Juniors. 3 credits: 3 lectures.

14–b. Hygiene and Sanitation. A continuation of 13–a. Professor Jackson.

Prerequisite: Zoölogy 13–a. Elective for Sophomores and Juniors. 3 credits: 3 lectures.

15–c. Hygiene and Sanitation. A continuation of 14–b. Professor Jackson.

Prerequisite: Zoölogy 14–b. Elective for Sophomores and Juniors. 3 credits: 3 lectures.

16–a. Evolution and Genetics. Lectures and assignments dealing with the various problems of evolution and their relation to human life. Work in evolution should, if possible, be preceded by a study of Comparative Physiology (Zoölogy 7–a, 8–b, and 9–c). Professor Jackson.

Prerequisite: Zoölogy 3–c. Elective for Juniors and Seniors. 3 credits: 3 lectures.

17–b. Evolution of Man. A continuation of 16–a. Lectures and assignments dealing with the origin and development of man and the problem of man's antiquity. Evidence of man's origin based on anatomical, embryonic and paleontological data will be discussed. A special emphasis will be given to the racial identity, origin and derivation of the English-speaking people. Professor Jackson.

Prerequisites: Zoölogy 16–a. Elective for Juniors and Seniors. 3 credits: 3 lectures.

18–c. Faunal Zoölogy. A study of the habits, life history and identification of local vertebrate animals with a special reference to the birds.

The object of this subject is to enable the student to identify common animals at sight and to become familiar with their habits and economic importance. The subject is intended for nature study directors, or others interested in the identification of common forms. Professor Jackson.

Prerequisite: Zoölogy 3–c. 3 credits: 2 lectures; 1 laboratory.

19–a. Advanced Zoölogy. Arranged to suit the need of students who wish to specialize in Zoölogy. Professor Jackson.

Prerequisites: This subject may not be elected except by students who have completed at least 18 hours in Zoölogy or Entomology with an average grade of at least 80; and then only on the presentation of a detailed outline of the problems they wish to study. The subject is primarily for graduate students. Open only to students by special permission. Credit and hours to be arranged.

20–b. Advanced Zoölogy. A continuation of 19–a. Professor Jackson.

Prerequisites: The same as for Zoölogy 19–a. Credit and hours to be arranged.

21–c. Advanced Zoölogy. A continuation of 20–b. Professor Jackson.

Prerequisites: The same as for Zoölogy 19–a. Credit and hours to be arranged.

Group B. Agricultural and Home Economics Subjects

30–a. General Zoölogy. A detailed study of the fundamental principles of life; the nature and physiology of protoplasm; the structure of the cell and the processes of cell division. The structure and physiology of man will be discussed in detail. There will then follow a discussion of the structure, habits, physiology and life history of the different types of animals. The economic aspect of this study will be emphasized so far as possible and its importance and relation to man. The laboratory work will consist of the study and dissection of type forms. Mrs. Jackson and Mr. ——.

Required of Freshmen in Agriculture. Open only to students of this division. 3 credits: 2 lectures; 1 laboratory.

31–b. General Zoölogy. A continuation of 30–a. Mrs. Jackson and Mr. ——.

Prerequisite: Zoölogy 30–a. Required of Freshmen in Agriculture. Open only to students of this division. 3 credits: 2 lectures; 1 laboratory.

32–c. General Zoölogy. A continuation of 31–b. Mrs. Jackson and Mr. ——.

Prerequisite: Zoölogy 31–b. Required of Freshmen in Agriculture. Open only to students of this division. 3 credits: 2 lectures; 1 laboratory.

33–a. Elementary Physiology and Hygiene. A general survey of the structure and function of the human body, with a study of the fundamental principles of hygiene as applied to the different systems. Collateral readings, written reports and conferences required. Mrs. Jackson.

Required of Sophomores in Home Economics. Open only to students in this course. 3 credits: 2 lectures; 1 laboratory.

34–b. Elementary Physiology and Hygiene. A continuation of 33–a. Mrs. Jackson.

Prerequisite: Zoölogy 33–a. Required of Sophomores in Home Economics. Open only to students in this course. 3 credits: 2 lectures; 1 laboratory.

35–c. Elementary Physiology and Hygiene. A continuation of 34–b. Mrs. Jackson.

Prerequisite: Zoölogy 34–b. Required of Sophomores in Home Economics. Open only to students in this course. 3 credits: 2 lectures; 1 laboratory.

*36–a. **Histology.** A detailed study of the structure of the tissues of vertebrate animals, cell specialization and the manner in which tissues are combined into organs. The subject is primarily for students intending to teach Zoölogy, a great deal of attention being paid to preparing microscope slides and general histological technique. Mrs. Jackson.

Prerequisite: Zoölogy 3–c or 35–c. Elective for Juniors and Seniors in Arts and Science. 3 credits: 1 lecture; 2 laboratories.

*37–b. **Histology.** A continuation of 36–a. Mrs. Jackson.

Prerequisites: Zoölogy 3–c and 36–a, or Zoölogy 35–c and 36–a. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 laboratories.

*38–c. **Histology.** A continuation of 37–b. Mrs. Jackson.

Prerequisites: Zoölogy 3–c and 37–b, or Zoölogy 35–c and 37–b. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 laboratories.

39–a. **Embryology.** A detailed study of the vertebrate embryo, its method of development, and the relation of the embryo to the parent. The work will be prefaced by the study of the details of cell structure, oögenesis, spermatogenesis, fertilization and segmentation; thus tracing the gradual development of the embryo from the single cell to maturity. The laboratory work will be primarily with the frog and chick embryo. The lectures will include human embryology. Mrs. Jackson.

Prerequisites: Zoölogy 3–c or 35–c. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

*40–b. **Embryology.** A continuation of 39–a. Mrs. Jackson.

Prerequisite: Zoölogy 39–a. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

*41–c. **Embryology.** A continuation of 40–b. Mrs. Jackson.

Prerequisite: Zoölogy 40–b. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

*42–a. **Physiology of Nutrition.** An advanced subject in the nature and physiology of nutrition. The anatomy and physiology of the alimentary tract and the allied organs of digestion will be discussed in

*Given in alternate years: Zoölogy 36–a, 37–b, and 38–c given in 1919–1920; Zoölogy 39–a, 40–b and 41–c given in 1920–1921

detail. The work will consist of lectures, assigned topics and laboratory experiments on digestion. Mrs. Jackson.

Prerequisite: Open only to Juniors and Seniors having at least 9 hours credit in Zoölogy. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

43-b. **Physiology of Circulation and Respiration.** An advanced subject in the nature and physiology of the organs of circulation and respiration. The subject will consist of lectures, assigned topics and laboratory experiments on the circulatory and respiratory processes within the body. Mrs. Jackson.

Prerequisite: Open only to Juniors and Seniors having at least 9 hours credit in Zoölogy. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

44-c. **Advanced Neurology.** A study of the structure and physiology of the human nervous system. The laboratory work will consist of a study of the different types of neurons, the nature of nervous impulses, and a detailed study of the nerve tracts in the brain and spinal cord. The structure, and physiology of the sense organs will also be considered. Mrs. Jackson.

Prerequisite: Open only to Juniors and Seniors having at least 9 hours credit in Zoölogy. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

ENGINEERING DIVISION

CHARLES E. HEWITT, *Dean*

DEPARTMENTS

ARCHITECTURE AND DRAWING	MECHANICAL ENGINEERING
CHEMISTRY	MINERALOGY
ELECTRICAL ENGINEERING	PHYSICS
MATHEMATICS	SHOPS

ARCHITECTURE AND DRAWING

ERIC T. HUDDLESTON, *Professor*
THOMAS J. LATON, *Assistant Professor*
PAUL H. SHRAMM, *Instructor*

These subjects are of an industrial and cultural nature and include the engineering, architectural and industrial-art branches of the subject, adapted to meet the utilitarian requirements of the several departments of the College.

Partial credit may be given for work done in preparatory schools if the work is satisfactory to the department. In order to get credit, the student must submit for examination the work done in the preparatory school. No college credit will be given for work submitted for entrance.

Students are advised not to purchase drawing materials before consultation with the drawing instructor. Instruments will be loaned to students upon a deposit, except that engineering and construction students must provide their own instruments at the beginning of their sophomore year.

1–a. **Engineering Drawing.** A study is made of the fundamentals of engineering drawing, including free-hand lettering, the use of drawing instruments, and the solution of drafting problems in orthographic projection. Text: "Engineering Drawing" by French. Assistant Professor Laton.

Required of Freshmen in Electrical, Mechanical, Mechanic Arts and Construction courses. 3 credits: 3 drawing periods.

2–b. **Machine Drawing.** A continuation of 1–a, taking up the study of isometric, oblique, axiometric and other systems of pictorial drawing with reference to their use in the sketching of machine parts; the study of various types of fastenings (bolts, screws, rivets, etc.);

drafting room methods as applied to commercial practice; tracing and blue-printing. Assistant Professor Laton.

Prerequisite: Drawing 1–a. Required of Freshmen in Electrical, Mechanical, Mechanic Arts and Construction courses. 3 credits: 3 drawing periods.

3–c. **Machine Drawing.** A continuation of 2–b, including the representation of machine and structural parts. Drawings are made from sketches and from the original machines, with individual problems in commercial machine drawing to conform to specified requirements. Assistant Professor Laton.

Prerequisite: Drawing 2–b. Required of Freshmen in Electrical, Mechanical, Mechanic Arts and Construction courses. 3 credits: 3 drawing periods.

4–a. **Descriptive Geometry.** An application of the principles of descriptive geometry to the solution of problems in points, lines, planes and solids. Assistant Professor Laton.

Prerequisite: Drawing 3–c. Required of Sophomores in Electrical, Mechanical, Mechanic Arts and Construction courses. 3 credits: 3 drawing periods.

5–a. **Mechanical Drawing.** A study of the fundamentals of mechanical drawing, including free-hand lettering, the use of drawing instruments, and a brief study of orthographic and isometric projection. Mr. Shramm.

Required of Freshmen in Chemical Engineering. 2 credits: 2 drawing periods.

10–c. **Agricultural Drawing.** Instruction in this subject includes drafting room exercises in free-hand lettering; the use of drawing instruments; a brief study of orthographic and isometric projection; together with the drawing of plans and elevations of simple farm structures. Assistant Professor Laton.

Required of Freshmen in Agriculture. 3 credits: 3 drawing periods.

20–a. **Home Economics Drawing.** Instruction is given in free-hand lettering, the use of drawing instruments, and the rudiments of orthographic and isometric projection drawing. This is followed by drafting room exercises in architectural representation as a preparation for further study in house planning. Professor Huddleston.

Required of Freshmen in Home Economics. 2 credits: 2 drawing periods.

21–b. **House Planning.** Lectures and recitations devoted to a brief study of the history of domestic architecture; the relation of the house plan to home making and to the individual family; its relation

to the individual site, to the garden, to accessory buildings, and to the community; supplemented by drafting room exercises devoted to an analytical study of house plans. Professor Huddleston.

Prerequisite: Drawing 20–a. Required of Freshmen in Home Economics. 2 credits: 1 lecture; 1 drawing period.

22–c. **House Structure.** A continuation of Drawing 21–b, taking up the study of an individual building problem, making working drawings for a small frame house designed by the student to conform to specified requirements. Professor Huddleston.

Prerequisite: Drawing 21–b. Required of Freshmen in Home Economics. 2 credits: 2 drawing periods.

23–a. **Elementary Design.** Studio exercises in the fundamentals of design, for the purpose of developing the student's ability to draw. Studies in pencil, pen and ink, and brush of lines, space arrangement, proportion of line and form, symmetry and balance, and their adaptation to motifs for decoration according to the laws of beauty, harmony and construction. Mr. Shramm.

Required of Sophomores in Home Economics. 2 credits: 2 drawing periods.

24–b. **Costume Design.** Studio exercises in pencil, pen and ink and brush devoted to an analytical study of historic ornament, flower and plant forms, and the human figure, in their application to costume design; studio methods in rendering draperies, fur, silk, velvet, lace and other textiles. Mr. Shramm.

Prerequisite: Drawing 23–a. Required of Sophomores in Home Economics. 2 credits: 2 drawing periods.

25–c. **Decorative Design.** Lectures throughout the term on color theories, harmonies, and qualities based on spectral colors, supplemented with studio work in different mediums, thereby giving practice in tinting, contrasting and harmonizing colors; stenciling, etc.; the application of these studies to costume design and interior decoration. Professor Huddleston and Mr. Shramm.

Prerequisite: Drawing 24–b. Required of Sophomores in Home Economics. 2 credits: 1 lecture; 1 drawing period.

*30–a, b, c. **Free-hand Drawing.** Studio exercises in the elements of design, leading to construction of units, motifs, and simple forms of ornament; a study of the principles of arrangement, proportion of line and form, symmetry and balance, according to the laws of beauty, harmony and construction. Mr. Shramm.

3 credits: 3 drawing periods.

*NOTE:—The object of such subject as Drawing 30 is not only to develop the utilitarian ideas involved in industrial and commerical art, but also to cultivate an appreciation and love of the beautiful in nature and art.

*31-a, b, c. **Advanced Free-hand Drawing.** Studio exercises in pencil, charcoal, pen and ink, and brush from plaster casts of the human form, plant and flower form, and from nature; in short, a study in perspective, light and shadow construction as involved in commercial design —such as posters, book-covers, textiles, wall paper, metal and jewelry design, etc. Mr. Shramm.

Prerequisite: Drawing 30. 3 credits: 3 drawing periods.

*32-a, b, c. **Advanced Drawing Composition.** Studio work adapted to the needs and ability of the individual student, either along lines of pure design, or taking up any of the industrial or commercial phases of the subject. Mr. Shramm.

Prerequisite: Drawing 31. 3 credits: 3 drawing periods.

40-a. **Architectural Drawing.** Drafting room exercises in architectural representation, followed by an analytical study of house plans and modern methods of building construction. Professor Huddleston.

Prerequisites: Drawing 102-b, Shop 10-c. Required of Juniors in Mechanic Arts. 3 credits: 3 drawing periods.

41-b. **Architectural Drawing.** A continuation of 40-a, taking up the study of an individual building problem, making working drawings for a small frame house designed by the student to conform to specified requirements. Professor Huddleston.

Prerequisite: Drawing 40-a. Required of Juniors in Mechanic Arts. 3 credits: 3 drawing periods.

102-b. **Industrial Arts Drawing.** Studio work in free-hand perspective as applied to making working sketches of wood joints, furniture and machine parts; a study of the principles of design suited to the mechanic arts, involving design studies for door and cabinet paneling, metal parts, hinges, escutcheons, draw pulls, etc. Mr. Shramm.

Required of Sophomores in Mechanic Arts and Construction courses. 3 credits: 3 drawing periods.

103-c. **Elements of Architecture.** Drafting room exercises in the study of the classic orders of architecture, and elementary studies in composition. Professor Huddleston.

Prerequisite: Drawing 102-b. Required of Sophomores in Mechanic Arts and Construction courses. 3 credits: 3 drawing periods.

*NOTE:—The object of such subjects as Drawing 31 and 32 is not only to develop the utilitarian ideas involved in industrial and commercial art, but also to cultivate an appreciation and love of the beautiful in nature and art.

104–a. **Architectural Drawing.** Drafting room exercises in architectural representation, followed by an analytical study of house plans and modern methods of building construction. Professor Huddleston.

Prerequisite: Drawing 102–b. Required of Juniors in Architectural Construction. 3 credits: 3 drawing periods.

105–b. **Architectural Drawing.** A continuation of 104–a, taking up the study of an individual building problem, making working drawings for a small frame house designed by the student to conform to specified requirements. Professor Huddleston.

Prerequisite: Drawing 104–a. Required of Juniors in Architectural Construction. 3 credits: 3 drawing periods.

106–c. **Architectural Drawing.** A continuation of 105–b, developing interior and exterior scale and full-size details. Professor Huddleston.

Prerequisite: Drawing 105–b. Required of Juniors in Architectural Construction. 3 credits: 3 drawing periods.

107–b. **Building Construction.** Conferences, text-book study and drafting room exercises in a comprehensive study of details of wood and masonry construction and their application to modern building construction. Professor Huddleston and Mr. ——.

Prerequisites: Drawing 4–a, Mechanical Engineering 103–a. Required of Juniors in Architectural Construction. 4 credits: 1 lecture; 3 drawing periods.

108–c. **Building Construction.** A continuation of 107–b, taking up construction details of reinforced concrete and steel. Professor Huddleston and Mr. ——.

Prerequisite: Drawing 107–b. Required of Juniors in Architectural Construction. 4 credits: 1 lecture; 3 drawing periods.

109–a. **Building Construction and Design.** Graded problems in structural design of buildings in wood and masonry, giving special consideration to mill-construction. Professor Huddleston and Mr. ——.

Prerequisite: Drawing 108–c. Required of Seniors in Architectural Construction. 8 credits: 8 drawing periods.

110–b. **Building Construction and Design.** A continuation of 109–a, taking up the design of buildings of reinforced concrete and steel construction. Professor Huddleston and Mr. ——.

Prerequisite: Drawing 109–a. Required of Seniors in Architectural Construction. 8 credits: 8 drawing periods.

111–c. **Architectural Thesis.** A thesis will be required of each student, consisting of a set of original working drawings, complete in details and specifications, for a public building designed to meet certain

specified conditions. This work must be done in the drafting room of the department and under the supervision of the instructor. Professor Huddleston and Mr. ——.

Prerequisite: Drawing 110-b. Required of Seniors in Architectural Construction. 8 credits: 8 drawing periods.

112-c. **Contracts and Specifications.** This subject comprises discussions of the principles and form of building contracts and standard specifications; study of the legal relation of the architect, the owner and the contractor; state laws concerning the erection of public buildings; labor laws, lien laws; building permits; building insurance; contracts and bonds. Professor Huddleston.

Required of Seniors in Architectural Construction. 1 credit: 1 recitation.

CHEMISTRY

CHARLES JAMES, *Professor*
GEORGE A. PERLEY, *Associate Professor*
OLUS J. STEWART, *Assistant Professor*
MELVIN M. SMITH, *Instructor*
HEMAN C. FOGG, *Instructor*

1-a. **Inorganic Chemistry.** Lectures and recitations on general and theoretical chemistry, illustrated by experiments, charts, specimens, lantern views, etc. Solution of chemical problems will be required. Professor James and Associate Professor Perley.

Required of Freshmen in Agriculture and Engineering. 3 credits: 2 lectures; 1 recitation.

2-b. **Inorganic Chemistry.** A continuation of 1-a. Professor James and Associate Professor Perley.

Prerequisite: Chemistry 1-a. Required of Freshmen in Agriculture and Engineering. 3 credits: 2 lectures; 1 recitation.

3-c. **Inorganic Chemistry.** A continuation of 2-b, but the time will be spent upon the metallic elements, their metallurgy, salts, etc. Professor James and Associate Professor Perley.

Prerequisite: Chemistry 2-b. Required of Freshmen in Agriculture and Engineering. 3 credits: 2 lectures; 1 recitation.

4-c. **Qualitative Analysis.** Laboratory practice, with occasional lectures and recitations. The student is expected to become proficient in the separation and detection of the common acids and bases, and to keep a full set of notes. Mr. Smith.

Prerequisite: Chemistry 2-b. Required of Freshmen in Chemistry. 3 credits: 3 laboratories.

5–c. Qualitative Analysis. Similar to Chemistry 4–c, but modified to suit students in Agriculture. Mr. Smith.

Prerequisite: Chemistry 2–b. Required of Freshmen in Agriculture. 3 credits: 3 laboratories.

6–a. Inorganic Chemistry. Similar to Chemistry 1–a. Mr. Smith.

Required of Freshmen in Home Economics. 4 credits: 3 recitations; 1 laboratory.

7–b. Inorganic Chemistry. Continuation of 6–a. Mr. Smith.

Prerequisite: Chemistry 6–a. Required of Freshmen in Home Economics. 4 credits: 3 recitations; 1 laboratory.

8–c. Inorganic Chemistry. Continuation of 7–b. Mr. Smith.

Prerequisite: Chemistry 7–b. Required of Freshmen in Home Economics. 4 credits: 3 recitations; 1 laboratory.

9–a. Qualitative Analysis. A continuation of 4–c, together with more advanced work upon insoluble substances, etc. Mr. Smith.

Prerequisite: Chemistry 4–c. Required of Sophomores in Chemistry. 3 credits: 3 laboratories.

10–a. Qualitative Analysis. Laboratory work with occasional lectures and recitations. The work covered includes the detection of the more familiar acids and bases both in simple and complex mixtures. Mr. Smith and Mr. Fogg.

Prerequisite: Chemistry 3–c. Required of students in Chemical Engineering. 6 credits: 6 laboratories.

11–a. Qualitative Analysis. Similar to Chemistry 4–c, but adapted to the use of students in Electrical and Mechanical Engineering. Mr. Smith and Mr. Fogg.

Prerequisite: Chemistry 2–b. 3 credits: 3 laboratories.

12–b. Qualitative Analysis. A continuation of 11–a. Mr. Smith and Mr. Fogg.

Prerequisite: Chemistry 11–a. 3 credits: 3 laboratories.

13–a. Quantitative Analysis. Introduction to quantitative analysis, consisting of the analyses of simple compounds and materials such as feeds, fertilizers, soils, water, etc. Assistant Professor Stewart.

Prerequisites: Chemistry 3–c and 5–c. Required of Sophomores in Agriculture. 2 credits: 2 laboratories.

14–b. Quantitative Analysis. Continuation of 13–a. Assistant Professor Stewart.

Prerequisite: Chemistry 13–a. 2 credits: 2 laboratories.

15–a. Organic Chemistry. A study of the more important organic compounds from the viewpoint of the Home Economics student. Mr. Fogg.

Prerequisite: Chemistry 8–c. Required of Sophomores in Home Economics. 2 credits: 2 recitations.

16–b. Organic Chemistry. Continuation of 15–a. Mr. Fogg.

Prerequisite: Chemistry 15–a. 2 credits: 2 recitations.

17–a. Inorganic Preparations. Laboratory work upon the preparation of pure salts. Associate Professor Perley.

Prerequisite: Chemistry 9–a. Required of Sophomores in Chemistry. 2 credits: 2 laboratories.

18–b. Quantitative Analysis. A preliminary study of quantitative analysis to familiarize the student with the general methods of chemical manipulation and analysis. Assistant Professor Stewart.

Prerequisites: Chemistry 3–c; Mathematics 2–a and 3–b. Required of students in Chemistry. Elective for Sophomores, Juniors and Seniors in Arts and Science, provided laboratory facilities permit. 5 credits: 5 laboratories.

19–c. Quantitative Analysis. A continuation of 18–b. Assistant Professor Stewart.

Prerequisite: Chemistry 18–b. Required of students in Chemistry. 7 credits: 7 laboratories.

20–a. Organic Chemistry. Lectures and recitations. A study of the chemistry of the carbon compounds. Professor James.

Prerequisite: Chemistry 3–c. Required of Sophomores in Chemistry. 2 credits: 2 lectures.

21–b. Organic Chemistry. A continuation of 20–a. Professor James.

Prerequisite: Chemistry 20–a. Required of Sophomores in Chemistry. 3 credits: 3 lectures.

22–c. Organic Chemistry. A continuation of 21–b. Professor James.

Prerequisite: Chemistry 21–b. Required of Sophomores in Chemistry. 3 credits: 3 lectures.

23–a. Household Chemistry. This subject treats of the chemistry of foods, beverages, baking chemicals, preservatives and detergents. Associate Professor Perley.

Prerequisite: Chemistry 8–c. Required of Juniors in Home Economics. 3 credits: 1 lecture; 2 laboratories.

*24-a-c. **Organic Chemistry Laboratory.** The work in this subject consists mainly of laboratory practice in preparing and purifying organic compounds. Lectures and recitations will be held from time to time in connection with the practice. Associate Professor Perley.

Prerequisite: Chemistry 22-c. Required of Juniors in Chemistry. 2 credits: 2 laboratories.

25-b. **Organic Chemistry Laboratory.** A continuation of Chemistry 24-a. Associate Professor Perley.

Prerequisite: Chemistry 22-c. Required of Juniors in Chemistry. 2 credits: 2 laboratories.

26-a. **Advanced Quantitative Analysis.** Assistant Professor Stewart

Prerequisite: Chemistry 19-c. Required of students in Chemistry. 4 credits: 4 laboratories.

27-b. **Advanced Quantitative Analysis.** A continuation of 26-a. Assistant Professor Stewart.

Prerequisite: Chemistry 26-a. Required of students in Chemistry. 4 credits: 4 laboratories.

28-c. **Advanced Quantitative Analysis.** A continuation of 27-b. Assistant Professor Stewart.

Prerequisite: Chemistry 27-b. Required of students in Chemistry. 4 credits: 4 laboratories.

29-a. **Physical Chemistry.** Advanced study of chemical theory. Practical experiments will be performed in the determination of vapor density, molecular weights, specific heat, etc.; and the study of isomorphism, diffusion of gases, solutions, ionization, electrolysis, molecular and atomic volume, thermo chemistry, equilibrium, the phase rule, etc., will take up much of the time. Associate Professor Perley.

Prerequisite: Chemistry 3-c. Required of Juniors in Chemistry. 3 credits; 3 lectures.

30-b. **Physical Chemistry.** A continuation of 29-a. Associate Professor Perley.

Prerequisite: Chemistry 29-a. Required of Juniors in Chemistry. 3 credits: 3 lectures.

31-c. **Physical Chemistry.** A continuation of 30-b. Associate Professor Perley.

Prerequisite: Chemistry 30-b. Required of Juniors in Chemistry. 3 credits: 3 lectures.

* Given as 24-c for students in the Arts course in Chemistry.

32–a. Advanced Inorganic Chemistry. Mainly a review. Professor James.

Prerequisite: Chemistry 3–c. Required of Seniors in the Arts and Science course in Chemistry. Elective for Students in Chemical Engineering. 3 credits: 3 lectures.

33–b. Advanced Inorganic Chemistry. An introduction to the rare elements. Professor James.

Prerequisite: Chemistry 32–a. Required of Seniors in the Arts and Science course in Chemistry. Elective for students in Chemical Engineering. 3 credits: 3 lectures.

34–c. Advanced Inorganic Chemistry. A continuation of 33–b, together with certain special subjects. Professor James.

Prerequisite: Chemistry 33–b. Elective for students in Chemical Engineering. 3 credits: 3 lectures.

35–a. Industrial Chemistry. Associate Professor Perley.

Prerequisite: Chemistry 3–c. Required of students in Chemical Engineering. Elective for students in the Arts and Science course in Chemistry. 3 credits: 3 lectures.

36–b. Industrial Chemistry. A continuation of 35–a. Associate Professor Perley.

Prerequisite: Chemistry 35–a. 3 credits: 3 lectures.

37–c. Industrial Chemistry. A continuation of 36–b. Associate Professor Perley.

Prerequisite: Chemistry 36–b. 3 credits: 3 lectures.

38–a. Advanced Quantitative Laboratory. Gas analysis, etc. Assistant Professor Stewart.

Prerequisite: Chemistry 28–c. Required of Seniors in Chemical Engineering. 5 credits: 5 laboratories.

39–a. Thesis. The time is devoted to some selected subject, and the student is required to present a thesis showing him to be a careful manipulator and a person of independent thought. Professor James.

For Seniors in Chemistry who have completed all quantitative analysis. 5 credits: 5 laboratories.

40–b. Thesis. Similar to Chemistry 39–a. Professor James.

Required of students in Chemical Engineering and students in Arts and Science course in Chemistry. 5 credits: 5 laboratories.

41–c. Thesis. A continuation of 40–b. Professor James.

Required of students in Chemical Engineering and students in Arts and Science course in Chemistry. 5 credits: 5 laboratories.

42-a. Physical Chemical Laboratory. Associate Professor Perley.

Prerequisite: Chemistry 31-c. Required of students in Chemical Engineering. 2 credits: 2 laboratories.

[**DRAWING**—see Architecture and Drawing, Page 130]

ELECTRICAL ENGINEERING

C. E. Hewitt, *Professor*
Leon W. Hitchcock, *Associate Professor*

1-a. Dynamo Electric Machinery. This subject includes a genera study of the various electrical quantities such as electromotive force, current, resistance, permeability of iron; the use of standard measuring instruments; direct and alternating current dynamos and motors, including elementary theory. A study is made of electrical measuring instruments, cells, batteries, electrolysis, electroplating, electrotyping, the elements of photometry and electric illumination, inductance, capacity, and elementary alternating currents. A large number of practical problems illustrate the applications of the above. One exercise a week is devoted to laboratory experiments illustrating the practical application of theory. Professor Hewitt.

Prerequisites: Physics 8-c and Mathematics 9-c. Required of Juniors in Electrical and Mechanical courses. 4 credits: 3 recitations; 1 laboratory.

2-b. Dynamo Electric Machinery. Continuation of 1-a. Professor Hewitt.

Prerequisite: Electrical Engineering 1-a. Required of Juniors in Electrical and Mechanical courses. 4 credits: 3 recitations; 1 laboratory.

3-c. Dynamo Electric Machinery. Continuation of 2-b. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 2-b. Required of Juniors in Electrical and Mechanical courses. 4 credits: 3 recitations; 1 laboratory.

4-c. Telegraph and Telephone. A study of the acoustic and electrical principles of telephony; transmitting and receiving apparatus; magneto and common-battery switchboards and accessories; selective party-line systems; intercommunicating systems; overhead and underground construction; phantom, simplex, and composite circuits; transpositions, etc.; the principles of telegraphy, sounders, repeaters, etc.; wireless telegraphy and telephony; automatic devices, electric signaling for purposes of alarm, railroads, etc. Associate Professor Hitchcock.

Elective for Juniors and Seniors. 3 credits: 3 recitations.

5–c. Application of Electricity to Agriculture. Arranged for and adapted to students taking agriculture. The subject consists of a general study of the electric dynamo and motor, method of connecting them to the supply circuit, and the care and operation of each; a general study of simple problems in transmission; methods of wiring for electric power and lighting; the telephone, including the general principles upon which it operates and different systems of installation; electric bell wiring and signaling apparatus; simple water power developments and equipments; electrical utensils for domestic use, etc. Professor Hewitt.

Elective for Seniors in Agriculture. 3 credits: 2 recitations; 1 laboratory.

6–a. Practical Electricity. Arranged for and adapted to students taking the Mechanics Arts course. Professor Hewitt.

Required of Seniors in the Mechanics Arts course. 3 credits: 2 recitations; 1 laboratory.

7–a. Electrical Engineering Practice. A study of the properties of periodic curves; the effects of inductance and capacity; the use of complex quantities; and a more detailed study of generators, motors, transformers, converters, and other electrical apparatus. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 3–c. 3 credits: 3 recitations.

8–b. Electrical Engineering Practice. A continuation of 7–a. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 7–a. 3 credits: 3 recitations.

9–c. Hydro-Electric Developments. A study of hydro-electric developments, including the design of reinforced concrete dams and power houses and the general subjects of water-power engineering; high tension power transmission; design of transmission lines and distributing systems; selection of apparatus for generating stations and distributing systems; lightning protection. Professor Hewitt.

Required of Seniors in Electrical and Mechanical Construction courses. 3 credits: 3 recitations.

10–a. Electric Railways. The practicability of construction from an economic standpoint; determination of the size, type, and seating capacity of cars; track location; train schedules; methods of control train resistance; speed-time and current-time curves; selection of motors; the feeder system; electrolysis; power station and sub-station location; storage batteries; electric track switches, etc. Illustrated by problems. Associate Professor Hitchcock.

Required of Seniors in Electrical Engineering. 3 credits: 3 recitations.

11-a. **Electrical Laboratory.** An advanced series of experiments. A written report will be required, for which one additional credit hour will be given. Professor Hewitt, Associate Professor Hitchcock.

Required of Seniors in Electrical Engineering. 3 credits: 2 laboratories.

12-b. **Electrical Laboratory.** Continuation of 11-a. Professor Hewitt, Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 11-a. Required of Seniors in Electrical Engineering. 3 credits: 2 laboratories.

14-c. **Thesis.** (A deposit of fifteen dollars to cover any damage done to instruments, apparatus, etc., is required in this subject. Any unexpended balance is refunded at the close of the college year. Where apparatus is constructed, as a part of a thesis, it shall remain the property of the department. Optional with head of department.) Professor Hewitt, Associate Professor Hitchcock.

Required of Seniors in Electrical Engineering. 3 credits: 1 recitation; 2 laboratories.

15-a. **Industrial Electricity.** A careful study of the methods employed in electrical measurements; resistance of wire and batteries; current measurement by ammeters and electrolysis; the use of electrical measuring instruments; a series of laboratory experiments specially arranged to meet the requirements of chemical engineers. A brief study will be made of the dynamo, motor, transformer, primary and secondary batteries, arc and incandescent lamps and the general principles of electrical distribution. Experiments in electrolysis, electrical furnaces, reduction of metals, etc., will be given. Associate Professor Hitchcock.

Required of Seniors in Chemical Engineering. 3 credits: 2 recitations; 1 laboratory.

16-b. **Industrial Electricity.** Continuation of 15-a. Professor Hewitt.

Prerequisite: Electrical Engineering 15-a. Required of Seniors in Chemical Engineering. 3 credits: 2 recitations; 1 laboratory.

17-c. **Industrial Electricity.** Continuation of 16-b. Professor Hewitt.

Prerequisite: Electrical Engineering 16-b. Required of Seniors in Chemical Engineering. 3 credits: 2 recitations; 1 laboratory.

18-c. **Design of Electrical Machinery.** A study of the design of the more important electrical machines, including the calculation of the dimensions of the machine, both electrical and mechanical, and the

predetermination of its performance from the dimensions. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 8–b. Required of Seniors in Electrical Engineering. 3 credits: 1 recitation; 2 laboratories.

19–c. **Illuminating Engineering.** A theoretical discussion of the principles of illumination and the application of these principles to concrete examples. Associate Professor Hitchcock.

Required of Seniors in Electrical Engineering who do not take Electrical Engineering 14–c. 3 credits: 3 recitations.

20–c. **Contracts and Specifications.** The laws and forms of engineering contracts; standard specifications for materials of construction and apparatus.

Required of Seniors in Electrical and Mechanical Engineering and Seniors in Electrical and Mechanical Construction courses. 2 credits: 2 recitations.

21–b. **Electrical Problems.** A large number of problems in both direct and alternating current will be performed to illustrate the application of electrical principles.

Elective for Seniors in Electrical and Mechanical Engineering. 2 credits: 2 recitations.

100–a. **Elements of Electrical Construction.** In the recitation period, a study is made of the following subjects: the general principles of electricity and magnetism; the general principles involved in the wiring of buildings in order that electricity may be used for electric lighting, electric power and for other domestic purposes; the requirements of the National Board of Fire Underwriters in connection with electrical installations.

In the laboratory periods, actual experiments are performed to illustrate the different types of electric wiring, including the use of the various electric fittings and their proper installation; various experiments are performed to illustrate in a practical way the general principles of electric construction. The laboratory periods run parallel with the recitation periods and give a student the actual practical applications of the different principles taken up. Professor Hewitt.

Required of Juniors taking Architectural, Electrical and Mechanical Construction. 3 credits: 2 lectures; 1 laboratory.

101–b. **Direct and Alternating Current Apparatus.** In the recitation periods the following subjects are studied: principles of dynamos and motors, both direct and alternating current; commercial testing for faults in dynamos, motors and other electrical devices; general repair work, including materials available for such work and the adapta-

tion of these materials to different kinds of repairing; signaling apparatus, bells, gas ignition, etc.; the method of computing the size of feeders and transmission circuits; measuring instruments, electric safety devices, switches, wattmeters, etc.; the fundamental principles and operation of telephones including bridging, series, and intercommunicating types.

In laboratory periods actual experiments are performed on dynamos and motors, both direct and alternating current, showing the method of connection, operation and care of the same; experiments are performed on different types of telephones; actual practice is given in repair work, winding of armatures, transformers, etc. Arrangements are made for experiments in testing out and locating faults in dynamos, motors, transformers, etc. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 100–a. Required of Juniors taking Architectural, Electrical and Mechanical Construction. 3 credits: 2 lectures; 1 laboratory.

102–c. **Direct and Alternating Current Apparatus.** Continuation of 101–b. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 101–b. Required of Juniors taking Architectural, Electrical and Mechanical Construction. 3 credits: 2 lectures; 1 laboratory.

103–a. **Electrical Machinery.** Its basic principles; the construction, operation and efficiency of such machinery; dynamos for constant potential, dynamos for constant current; series, shunt, compound and differential wound motors; motor generators and boosters; polyphase alternators and polyphase motors; transformers; synchronous and induction motors. Professor Hewitt.

Prerequisite: Electrical Engineering 102–c. Required of Seniors taking Electrical Construction. 4 credits: 4 lectures.

104–b. **Electric Machinery.** Continuation of 103–a. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 103–a. Required of Seniors taking Electrical Construction. 4 credits: 4 lectures.

105–a. **Electric Laboratory.** Dynamo efficiency and special dynamo operations; alternating current generators; synchronous machines; induction motor tests; transformer tests; rotary converter, etc. Associate Professor Hitchcock.

Required of Seniors taking Electrical Construction. 2 credits: 2 laboratories.

106–b. Electric Laboratory. Continuation of 105–a. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 105–a. Required of Seniors taking Electrical Construction. 2 credits: 2 laboratories.

107–c. Electric Laboratory. Continuation of 106–b. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 106–b. Required of Seniors taking Electrical Construction. 2 credits: 2 laboratories.

108–a. Electric Design. Study of principles; complete designs are made of a rheostat, electro-magnets, switches, electrical controlling devices, regulators, etc. Associate Professor Hitchcock.

Required of Seniors taking Electrical and Mechanical Construction. 2 credits: 1 lecture; 1 laboratory.

109–b. Electric Design. Continuation of 108–a. Associate Professor Hitchcock.

Prerequisite: Electrical Engineering 108–a. Required of Seniors taking Electrical and Mechanical Construction. 2 credits: 1 lecture; 1 laboratory.

MATHEMATICS

CHARLES C. STECK, *Professor*
CARL A. GARABIDIAN, *Instructor*
JESSE PIERCE, *Instructor*
HORACE OLSON, *Instructor*

1–a. Trigonometry. The general angle; trigonometric functions of the general angle; radian measure; solution of right and oblique triangles with and without logarithms; trigonometric identities and equations; inverse trigonometric functions. Professor Steck, Mr. Pierce and Mr. Olson.

Mathematics 2–a or 101–a required as a parallel subject. Required of Freshmen in Engineering, Mechanic Arts, Construction and Arts and Science Chemistry. 3 credits: 3 recitations.

2–a. Algebra. Review of fundamental operations; theory and use of logarithms; graphs of simple algebraic functions. Professor Steck, Mr. Pierce and Mr. Olson.

Mathematics 1–a required as a parallel subject. Required of Freshmen in Engineering, and in Arts and Science Chemistry. 3 credits: 3 recitations.

3–b. Algebra. A continuation of 2–a. Variations; complex numbers; elements of determinants and theory of equations; special prob-

lems in solid geometry for algebraic solution. Professor Steck, Mr. Pierce, Mr. Olson.

Prerequisites: Mathematics 1–a and 2–a; Mathematics 4–b required as a parallel subject. Required of Freshmen in Engineering and in Arts and Science Chemistry. 3 credits: 3 recitations.

4–b. **Analytic Geometry.** Cartesian and polar co-ordinates; graphs of algebraic functions; change of co-ordinate axes; graphs of transcendental functions; straight line; circle; conics. Professor Steck, Mr. Pierce, Mr. Olson.

Prerequisites: Mathematics 1–a and 2–a; Mathematics 3–b required as a parallel subject. Required of Freshmen in Engineering and in Arts and Science Chemistry. 3 credits: 3 recitations.

5–c. **Analytic Geometry.** A continuation of 4–b. Empirical equations; higher plans curves; analytic geometry of space. Professor Steck, Mr. Pierce and Mr. Olson.

Prerequisites: Mathematics 3–b and 4–b; Mathematics 6–c required as a parallel subject. Required of Freshmen in Engineering and in Arts and Science Chemistry. 3 credits: 3 recitations.

6–c. **Calculus.** Differentiation of the standard elementary forms, with simple applications. Professor Steck, Mr. Pierce and Mr. Olson.

Prerequisites: Mathematics 3–b and 4–b; Mathematics 5–c required as a parallel subject. Required of Freshmen in Engineering and in Arts and Science Chemistry. 3 credits: 3 recitations.

7–a. **Calculus.** A continuation of 6–c. More advanced applications of differentiation; integration of standard elementary forms. Professor Steck and Mr. Pierce.

Prerequisites: Mathematics 5–c and 6–c. Required of Sophomores in Engineering and in Arts and Science Chemistry. 3 credits: 3 recitations.

8–b. **Calculus.** A continuation of Mathematics 7–a. Special methods of integration; the definite integral; applications of the definite integral. Professor Steck and Mr. Pierce.

Prerequisite: Mathematics 7–a. Required of Sophomores in Engineering. 3 credits: 3 recitations.

9–c. **Calculus.** A continuation of Mathematics 8–b. Applications of the definite integral to geometry, physics and mechanics. Professor Steck and Mr. Pierce.

Prerequisite: Mathematics 8–b. Required of Sophomores in Engineering. 3 credits: 3 recitations.

10–a. **Advanced Calculus.** A study of ordinary differential equations, especially those of the first and second orders, with applications to geometry, physics and mechanics. Mr. Pierce.

Prerequisite: Mathematics 9–c. Elective for Juniors and Seniors in Engineering and in Arts and Science. Not given in 1919–1920. 3 credits: 3 recitations.

11–b. **Advanced Calculus.** A study of some of the more advanced topics of differential and integral calculus. Professor Steck.

Prerequisite: Mathematics 9–c. 3 credits: 3 recitations.

12–c. **Advanced Calculus.** A continuation of 11–b. Professor Steck.

Prerequisite: Mathematics 11–b. 3 credits: 3 recitations.

13–a. **Teaching of Mathematics in Secondary Schools.** Lectures and reports on assigned readings. Particular attention given to the teaching of first-year algebra and plane geometry. A term paper on some assigned topic will be required. Professor Steck.

Prerequisite: Education 1–a and 2–b. Offered in alternate years. Given in 1919–1920. 3 credits: 3 recitations.

14–b. **Theory of Equations and Determinants.** Definitions and properties of determinants; complex numbers; properties of polynomials and equations; solution of numerical equations; elimination. Professor Steck.

Prerequisite: Mathematics 9–c. Offered in alternate years. Given in 1920–1921. 3 credits: 3 recitations.

15–c. **Theory of Equations and Determinants.** A continuation of 14–b.

Prerequisite: 14–b. Offered in alternate years. Given in 1920–1921. 3 credits: 3 recitations.

16–a. **Advanced Analytic Geometry.** More advanced work than that covered in Mathematics 5–c. Professor Steck.

Prerequisite: Mathematics 9–c. Offered in alternate years. Given in 1919–1920. 3 credits: 3 recitations.

17–b. **Advanced Analytic Geometry.** An introduction to analytic geometry from the modern point of view. Professor Steck.

Prerequisite: Mathematics 16–a. Offered in alternate years. Given in 1919–1920. 3 credits: 3 recitations.

18–c. **Advanced Analytic Geometry.** A continuation of 17–b. Professor Steck.

Prerequisite: Mathematics 17–b. 3 credits: 3 recitations.

19-a. **Surveying.** Theory, use and adjustment of the chain, level and transit. The field work consists of measuring distances, angles and areas with the chain; establishing bench marks, running profiles, grade lines and cross-sections with the level; finding areas with the transit. Mr. Pierce.

Prerequisites: Mathematics 9-c and Drawing 3-c. Required of Seniors in Mechanical and Electrical Engineering and Seniors in Arts and Science majoring in mathematics. 3 credits: 3 laboratories.

20-c. **Surveying.** A continuation of 19-a. Theory, use and adjustment of the plane table. The field work consists of laying out simple curves with the transit and making topographic maps with the plane table and transit. Mr. Pierce.

Prerequisite: Mathematics 19-a. Required of Seniors in Mechanical and Electrical Engineering, and Arts and Science Seniors majoring in Mathematics. 3 credits: 3 laboratories.

21-b. **Trigonomtery.** The elements of plane trigonometry. Mr. Olson.

Required of Freshmen in Agriculture. 3 credits: 3 recitations.

22-a. **Surveying.** Theory and use of the chain, level and transit. The field work consists of measuring distances, angles and areas with the chain; establishing bench marks, running profiles, grade lines and cross sections with the level; finding areas with the transit. Mr. Pierce.

Prerequisite: Mathematics 1-a or 21-b. Required of Seniors in Agriculture (Horticulture and Forestry), and Construction. Elective for other Seniors in Agriculture and Mechanic Arts. 3 credits: 3 laboratories.

23-c. **Surveying.** A continuation of 22-a. Theory and use of the plane table. The making of topographic maps with the plane table and transit. Mr. Pierce.

Prerequisite: Mathematics 22-a. Required of Seniors in Construction Engineering. Elective for Seniors in Agriculture and Mechanic Arts. 3 credits: 3 laboratories.

101-a. **Algebra.** Review of fundamental operations including quadratics; theory and use of logarithms; graphs of simple algebraic curves. Professor Steck, Mr. Pierce, Mr. Olson.

Prerequisite: Mathematics 1-a required as a parallel subject. Required of Freshmen in Mechanic Arts and Construction courses. 3 credits: 3 recitations.

102-b. **Shop Mathematics.** Applications of algebra, geometry and trigonometry to shop problems. Professor Steck.

Prerequisites: Mathematics 1-a and 101-a. Required of Freshmen in Construction and Mechanic Arts. 3 credits: 3 recitations.

103–c. **Practical Mathematics.** Selected topics from algebra and geometry, with applications to practical problems. Professor Steck.

Prerequisite: Mathematics 102–b. Required of Freshmen in Construction and Mechanic Arts. 3 credits: 3 recitations.

MECHANICAL ENGINEERING

EDWARD L. GETCHELL, *Instructor and Acting Head of Department*
—— ——, *Assistant*

1–b. **Kinematics of Machinery.** A study of motion in machine construction; instantaneous centers and their application to the analysis of the direction and velocity of motion; velocity and acceleration diagrams; design of quick return mechanisms; study of tooth gearing; design of cams; and the study of trains of gearing. —— ——, Assistant.

Prerequisite: Drawing 4–a. Required of Sophomores in Electrical and Mechanical Engineering. 3 credits: 2 recitations; 1 laboratory.

2–c. **Mechanics.** Force; equilibrium; composition and resolution of forces; center of gravity; couples; non-current forces; stresses in cranes and framed structures; moment of inertia of areas and solids; motion of translation and rotation. Mr. Getchell.

Prerequisite: Mathematics 8–b. Required of Sophomores in Electrical and Mechanical Engineering. 4 credits: 4 recitations.

3–a. **Mechanics.** Work; energy; power; friction; dynamometers; principles of dynamics as applied to the design of flywheels and other moving parts of machines. Mr. Getchell.

Prerequisite: Mechanical Engineering 2–c. Required of Juniors in Electrical and Mechanical Engineering. 3 credits: 3 recitations.

4–b. **Mechanics.** Elementary stresses and strains; shear; riveted joints; strength and stiffness of beams; design of beams; continuous girders; torsion; resilience; columns and column formulas used by engineers. Mr. Getchell.

Prerequisite: Mechanical Engineering 3–a. Required of Juniors in Electrical and Mechanical Engineering. 3 credits: 3 recitations.

5–a. **Mechanical Laboratory.** Efficiency tests of simple machines; calibration of instruments used in laboratory practice; tension, transverse, and compression tests of steel, iron and wood. —— ——, Assistant.

Prerequisite: Mechanical Engineering 2–c. Required of Juniors in Electrical and Mechanical Engineering. 2 credits: 1 laboratory.

6-b. **Mechanical Laboratory.** Tests of lubricating oils; valve setting; steam calorimeter tests; flue gas analysis; engine clearance volume tests; etc. —— ——, Assistant.

Prerequisite: Mechanical Engineering 5-a. Required of Juniors in Electrical and Mechanical Engineering. 2 credits: 1 laboratory.

7-c. **Mechanical Laboratory.** Friction tests of steam engines; cement and concrete tests; calibration of weirs and orifices; oxyacetylene welding and cutting. —— ——, Assistant.

Prerequisite: Mechanical Engineering 6-b. Required of Juniors in Electrical and Mechanical Engineering. 2 credits: 1 laboratory.

8-a. **Materials of Construction.** Manufacture of iron and steel, brasses, and white metal alloys; heat treatment of steel; manufacture of cement; production of cast iron and cast steel, together with the proper arrangement of foundry and equipment; machinery for and arrangement of smithy; drop forging; wire drawing, etc. —— ——, Assistant.

Required of Juniors in Electrical and Mechanical Engineering; Seniors in Chemical Engineering; and Juniors in Construction. 3 credits: 3 recitations.

9-a. **Valve Gears and Boiler Design.** The application of the Bilgram and Zuener valve diagrams to practical problems in connection with the slide valve. The study of various types of valve gears and governors. The design of the slide valve and the Corliss valve, and the complete design of a return tubular boiler. —— ——, Assistant.

Prerequisite: Mechanical Engineering 2-c. Required of Juniors in Mechanical and Electrical Engineering. 3 credits: 1 recitation, 2 laboratories.

10-b. **Machine Design.** The elements of machines; friction; lubrication; axles and shafting; belt, rope, and chain transmission; toothed gearing; flywheels and pulleys; machine frames and attachments. The work of the class room is to be supplemented by practical problems in the drawing room. Mr. Getchell.

Prerequisite: Mechanical Engineering 3-a. Required of Juniors in Mechanical and Electrical Engineering. 3 credits: 2 recitations; 1 laboratory.

11-c. **Machine Design.** A continuation of 10-b. The work in the drawing room includes the complete design of some machine, together with an estimate of the cost of the machine completely manufactured. Mr. Getchell.

Prerequisite: Mechanical Engineering 10-b. Required of Juniors in Mechanical and Electrical Engineering. 3 credits: 1 recitation; 2 laboratories.

12–a. **Hydraulics.** The mechanics of liquids; pressure on submerged areas such as gates, dams, etc., measurement of the flow of water through weirs, nozzles, orifices, and the flow of water in pipes, channels, and streams. —— ——, Assistant.

Prerequisite: Mechanical Engineering 4–b. Required of Seniors in Mechanical and Electrical Engineering. 3 credits: 3 recitations.

13–b. **Hydraulics.** A continuation of 12–a. The application of the principles of hydraulics to water motors such as turbines, overshot and undershot wheels, Pelton wheels, etc.; also the consideration of the various types of rotary pumps. —— ——, Assistant.

Prerequisite: Mechanical Engineering 12–a. Required of Seniors in Mechanical and Electrical Engineering. 3 credits: 3 recitations.

14–b. **Thermodynamics.** A study of the principles of thermodynamics, and the thermodynamic properties of steam and gases. Efficiency of engine cycles; the steam engine, simple, compound and triple expansion; calorimeters and the testing of steam engines. Mr. Getchell.

Prerequisite: Mathematics 8–b. Required of Juniors in Mechanical and Electrical Engineering, and Seniors in Chemical Engineering. 3 credits: 3 recitations.

15–c. **Thermodynamics.** A continuation of 14–b. Economy of the steam engine and methods of increasing this economy; study of different types of internal combustion engines; air compressors; refrigeration machine; injectors; steam turbines and the design of turbine nozzles. Mr. Getchell.

Prerequisite: Mechanical Engineering 14–b. Required of Juniors in Mechanical and Electrical Engineering and Seniors in Chemical Engineering. 3 credits: 3 recitations.

16–a. **Steam Power Plants.** Fuels and combustion and the losses due to incomplete combustion; boilers of various types; furnaces and stokers; methods of handling coal and ash; design of stacks; and a study of the different types of reciprocating engines. Mr. Getchell.

Prerequisite: Mechanical Engineering 15–c. Required of Seniors in Mechanical and Electrical Engineering. 3 credits: 3 recitations.

17–b. **Steam Power Plants.** A continuation of 16–a. The study of the various types of steam turbines, condensers, feed water purifiers and heaters, pumps and other auxiliary equipment of the steam power plant. Mr. Getchell.

Prerequisite: Mechanical Engineering 16–a. Required of Seniors in Mechanical and Electrical Engineering. 3 credits: 3 recitations.

18–a. **Mechanical Laboratory.** Fuel analysis; gas and steam engine tests; tests of different types of injectors; pump tests, and boiler tests. —— ——, Assistant.

Prerequisite: Mechanical Engineering 15-c. Required of Seniors in Mechanical and Electrical Engineering. 2 credits: 1 laboratory.

19–b. **Mechanical Laboratory.** A continuation of 18–a. Special work of an advanced nature in testing machines, etc. —— ——, Assistant.

Prerequisite: Mechanical Engineering 18-a. Required of Seniors in Mechanical Engineering. 2 credits: 1 laboratory.

20–c. **Mechanical Laboratory.** A continuation of 19–b. Original work to be carried out under the direction of the instructor. —— ——, Assistant.

Prerequisite: Mechanical Engineering 19-b. Required of Seniors in Mechanical Engineering. 2 credits: 1 laboratory.

21–b. **Heating and Ventilating.** A study of the heat losses and the design of heating and ventilating systems as applied to residence and low pressure work.

Required of Seniors in Mechanical Engineering. 3 credits: 2 recitations; 1 laboratory.

22–c. **Heating and Ventilating.** A continuation of 21–b with special reference to the heating and ventilating of factory buildings and low pressure district heating. —— ——, Assistant.

Prerequisite: Mechanical Engineering 21–b. Required of Seniors in Mechanical Engineering. 3 credits: 1 recitation; 2 laboratories.

23–b. **Power Plant Design.** The design of a complete power plant for mill or factory, including the choice and location of necessary boilers, engines, or turbines and all auxiliary apparatus needed for a complete steam plant, together with the design of a suitable building for housing the same. Mr. Getchell.

Prerequisite: Mechanical Engineering 16–a. Required of Seniors in Mechanical Engineering. 2 credits: 2 laboratories.

24–c. **Power Plant Design.** A continuation of 23–b. The layout and equipment of a mill or factory with reference to the greatest efficiency of operation. Mr. Getchell.

Prerequisite: Mechanical Engineering 23–b. Required of Seniors in Mechanical Engineering. 2 credits: 2 laboratories.

25–a. Industrial Engineering. A study of factory conditions, safety devices, sanitation, lighting, ventilation, fire prevention, methods of keeping costs and methods of supervision of factories. —— ——, Assistant.

Prerequisite: Mechanical Engineering 17–b. Required of Seniors in Mechanical Engineering. 3 credits: 3 recitations.

26–b. Industrial Engineering. A continuation of 25–a. A study of several of the forms of scientific management as applied to factory supervision. —— ——, Assistant.

Prerequisite: Mechanical Engineering 25–a. Required of Seniors in Mechanical Engineering. 2 credits: 2 recitations.

101–b. Mechanics. Principles of mechanics as applied to engineering structures involving composition of forces, analytics, graphics, conditions of equilibrium, center of gravity, riveted joints. Mr. Getchell.

Required of Sophomores in Construction. 3 credits: 3 recitations.

102–c. Mechanics. A continuation of 101–b. Concurrent forces, motion of translation and rotation, dynamics as applied to the design of flywheels and other rotating parts. Mr. Getchell.

Prerequisite: Mechanical Engineering 101–b. Required of Sophomores in Construction. 3 credits: 3 recitations.

103–a. Mechanics. A continuation of 102–c. Strength of materials, design of beams, columns, etc. Mr. Getchell.

Prerequisite: Mechanical Engineering 102–c. Required of Juniors in Construction. 3 credits: 3 recitations.

104–a. Boiler Design and Graphics. A study of the graphical solution of forces acting on roof trusses and other framed structures, and the complete design of a return tubular boiler. —— ——, Assistant.

Prerequisite: Mechanical Engineering 102–c. Required of Juniors in Mechanical and Electrical Construction. 3 credits: 3 laboratories.

105–b. Boilers. A study of fuels, the theory of combustion, the various types of boilers, and the design of chimneys and cooling towers. —— ——, Assistant.

Required of Juniors in Mechanical and Electrical Construction. 3 credits: 3 recitations.

106–c. Engines and Turbines. A study of the theory of the steam engine and of the various types of reciprocating engines and steam turbines. —— ——, Assistant.

Required of Juniors in Mechanical and Electrical Construction. 3 credits: 3 recitations.

107–a. **Mechanical Laboratory.** Testing materials that enter into building construction, and construction of machines. —— ——, Assistant.

Prerequisite: Mechanical Engineering 162–c. Required of all Juniors in Construction. 2 credits: 1 laboratory.

108–b. **Mechanical Laboratory.** Testing of gages and other instruments that are used in the laboratory; tests of lubricating oils, calorimeters, flue gas analysis, etc. —— ——, Assistant.

Prerequisite: Mechanical Engineering 107–a. Required of Juniors in Mechanical and Electrical Construction. 2 credits: 1 laboratory.

109–c. **Mechanical Laboratory.** Brake tests on gas and steam engines, steam injector tests, coal analysis, and boiler tests. —— ——, Assistant.

Prerequisite: Mechanical Engineering 108–b. Required of Juniors in Mechanical and Electrical Construction. 2 credits: 1 laboratory.

110–b. **Machine Design.** The application of principles of mechanics to the design of some machine. Mr. Getchell.

Prerequisite: Mechanical Engineering 103–a. Required of Juniors in Electrical and Mechanical Construction. 2 credits: 2 laboratories.

111–a. **Heating and Ventilating.** The principles of heating and ventilating as applied to the installation of heating systems in residences. —— ——, Assistant.

Required of Seniors in Mechanical Construction. 4 credits: 2 recitations; 2 laboratories.

112–b. **Heating and Ventilating.** A continuation of 111–a. A study of the problems arising in the heating and ventilating of factories and mills and those in connection with low pressure district heating. —— ——, Assistant.

Prerequisite: Mechanical Engineering 111–a. Required of Seniors in Mechanical Construction. 4 credits: 2 recitations; 2 laboratories.

113–c. **Industrial Engineering.** A study of factory conditions, safety devices, sanitation, lighting, ventilating, fire prevention, methods of keeping costs and methods of supervision of factories. —— ——, Assistant.

Required of Seniors in Mechanical Construction. 3 credits: 3 recitations.

114–a. Mechanical Laboratory. Advanced work in engine testing and the testing of the machines that are used in the laboratory. —— ——, Assistant.

Required of Seniors in Mechanical Construction. 2 credits: 1 laboratory.

115–b. Mechanical Laboratory. A continuation of 114–a. Advanced work in engine testing and the testing of the machines that are used in the laboratory. —— ——, Assistant.

Prerequisite: Mechanical Engineering 114–a. Required of Seniors in Mechanical Construction. 2 credits: 1 laboratory.

116–c. Mechanical Laboratory. A continuation of 115–b. Advanced work in engine testing and the testing of the machines that are used in the laboratory. —— ——, Assistant.

Prerequisite: Mechanical Engineering 115–b. Required of Seniors in Mechanical Construction. 2 credits: 1 laboratory.

117–b. Power Plant Design. The design of a complete power plant for a factory. This will include the choice of the proper boilers, engines or turbines, and auxiliary apparatus, and the most efficient layout for the equipment chosen. Mr. Getchell.

Required of Seniors in Mechanical Construction. 3 credits: 2 recitations; 1 laboratory.

118–c. Power Plant Design. A continuation of 117–b. The work includes the layout of the machinery of a factory with special reference to the most efficient routing of the products through the building. Mr. Getchell.

Prerequisite: Mechanical Engineering 117–b. Required of Seniors in Mechanical Construction. 3 credits: 1 recitation; 2 laboratories.

119–b. Hydraulics. Hydrostatics; instruments and observations; theoretical and actual flow through orifices, weirs, pipes and conduits; dynamic pressure of water. —— ——, Assistant.

Required of Seniors in Mechanical and Electrical Construction. 3 credits: 3 recitations.

MINERALOGY

CHARLES JAMES, *Professor*
MELVIN M. SMITH, *Instructor*

1–b. Mineralogy. A brief study of blowpipe analysis, followed by laboratory practice in the determination and study of minerals, with special reference to their economic value. Mr. Smith.

Prerequisite: Chemistry 3–c. Required of students in Chemical Engineering. 3 credits: 3 laboratories.

PHYSICS

HORACE L. HOWES, *Professor*
CLEMENT MORAN, *Assistant Professor*
L. B. HOFFMAN, *Student Assistant*

1–a. **Introductory Physics.** Properties of matter; mechanics; heat. Experimental lectures with certain required and optional references. Professor Howes.

Required of Sophomores in Construction, Agriculture and Mechanic Arts courses. 3 credits: 3 lectures.

2–b. **Introductory Physics.** A continuation of 1–a, covering the subjects of magnetism and electricity. Professor Howes.

Prerequisite: Physics 1–a. Required of Sophomores in Construction, Agriculture and Mechanic Arts courses. 3 credits: 3 lectures.

3–c. **Introductory Physics.** A continuation of 2–b, covering the subjects of wave motion, sound and light. Professor Howes.

Prerequisite: Physics 2–b. Required of Sophomores in Construction, Agriculture and Mechanic Arts courses. 3 credits: 3 recitations.

4–a. **Elementary Physics.** Selected topics in physics of elementary grade. Stress is laid on fundamental principles and their applications. Assistant Professor Moran.

Required of Freshmen in Home Economics and of Sophomores in Mechanic Arts. 3 credits: 2 recitations; 1 laboratory.

5–b. **Elementary Physics.** A continuation of 4–a. Assistant Professor Moran.

Prerequisite: Physics 4–a. Required of Freshmen in Home Economics and of Sophomores in Mechanic Arts. 3 credits: 2 recitations; 1 laboratory.

6–a. **General Physics.** Mechanics. Lectures, recitations and problems based upon some standard text. Calculus should precede or accompany this course. Physics 9–a covers the same subject in the laboratory and should be taken at the same time. Professor Howes, Assistant Professor Moran.

Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. 3 credits: 3 lectures.

7–b. **General Physics.** A continuation of 6–a, covering the subjects of heat, sound and light. Professor Howes, Assistant Professor Moran.

Prerequisite: Physics 6–a. Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. 3 credits: 3 lectures.

8–c. **General Physics.** A continuation of 7–b, covering the subjects of magnetism and electricity. Professor Howes, Assistant Professor Moran.

Prerequisite: Physics 7–b. Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. 3 credits: 3 lectures.

9–a. **General Physics Laboratory.** Laboratory experiments in Mechanics, with written reports to accompany Physics 6–a. Assistant Professor Moran and Mr. Hoffman.

Prerequisite or parallel subjects: Physics 4–a or 6–a. Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. 3 credits: 2 laboratories.

10–b. **General Physics Laboratory.** A continuation of 9–a, covering heat, sound and light. Assistant Professor Moran and Mr. Hoffman.

Prerequisite or parallel subjects: Physics 5–b or 7–b; Physics 9–a. Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. 3 credits: 2 laboratories.

11–c. **General Physics Laboratory.** A continuation of 10–b, covering magnetism and electricity. Assistant Professor Moran and Mr. Hoffman.

Prerequisites or parallel subjects: Physics 8–c; Physics 10–b. Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. 3 credits: 2 laboratories.

12–a. **Household Physics.** Professor Howes.

Prerequisites: Physics 4–a and 5–b, or a one-year course in high school in the elements of physics. For Sophomores in Home Economics and open only to Smith-Hughes students. 3 credits: 2 recitations; 1 laboratory.

13–c. **Elementary Optics and Photography.** Lectures on the fundamental principles of geometrical optics and photographic instruments. A part of the laboratory work will consist of taking and finishing photographs. Students will furnish their own cameras and supplies. Assistant Professor Moran.

Elective for all students except Freshmen and Two-Year Students in the first year 3 credits: 2 exercises; 1 laboratory.

101–c. **Physics of Construction.** The principles of physics as applied in heating plants, in electrical apparatus, in plumbing, etc. Professor Howes.

Required of Juniors in Architectural Construction. 3 credits: 2 recitations; 1 lecture.

SHOPS

EDWARD L. GETCHELL, *Instructor and Acting Head of Department*
LYMAN J. BATCHELDER, *Instructor*
HAROLD D. MCBRIDE, *Instructor*

1-a. **Wood Work.** Instruction in the use and care of wood-working tools and machinery, saw filing, the steel square and its uses, plain pattern making, plain cabinet making and plain construction. Mr. Batchelder.

Required of Freshmen in Engineering and Mechanic Arts. 2 credits: 2 laboratories.

2-b. **Wood Work.** A continuation of 1-a. Plain cabinet work. Mr. Batchelder.

Required of all Freshmen in Construction courses and Mechanic Arts. 2 credits: 2 laboratories.

3-c. **Wood Work.** Foundry practice and pattern making. Management of cupola and reverberatory furnace in the making of cast iron; making of cores; flute and bench mouldings; setting of cores, and advanced pattern making. Mr. Batchelder.

Required of all Freshmen in Construction and Mechanic Arts. 2 credits: 2 laboratories.

4-b. **Forging.** This is a study of the forging of iron and steel and is designed to teach the operations of drawing, upsetting, welding, twisting, splitting, and punching of iron; the hardening, tempering, and annealing of cast steel; and the case hardening of mild steel as adapted to agricultural work. Mr. McBride.

Required of Juniors in Agriculture. 2 credits: 2 laboratories.

5-c. **Forging.** This is a study of the operations necessary in the forging of iron and steel and is designed to teach the methods of drawing, upsetting, welding, twisting, splitting, and punching of iron; also the hardening, tempering, and annealing of cast steel, and the case hardening of mild steel as adapted to engineering work. Mr. McBride.

Required of Freshmen in Mechanical and Electrical Engineering. 2 credits: 2 laboratories.

6-a. **Machine Work.** Exercises in bench work, chipping, filing, and scraping, and the laying out of work from drawings. A study of cutting edges and tool adjustments, together with a study of the cutting speeds and feeds on lathes, drill presses, etc. Practice in operating the drill press, and simple lathe work. Mr. McBride.

Required of Sophomores in Mechanical and Electrical Engineering. 2 credits: 2 laboratories.

7–b. Machine Work. A continuation of 6–a. Mr. McBride.

Prerequisite: Shop 6–a. Required of Sophomores in Mechanical and Electrical Engineering. 2 credits: 2 laboratories.

8–c. Machine Work. Advanced lathe work; also practice in the use of the milling machine, planer, shaper and grinder. Mr. McBride.

Required of Sophomores in Mechanical and Electrical Engineering. 2 credits: 2 laboratories.

9–a. Wood Work. Advanced cabinet work. Mr. Batchelder.

Required of Juniors in Mechanic Arts. 2 credits: 2 laboratories.

10–b. Wood Work. A continuation of 9–a. Mr. Batchelder.

Prerequisite: Shop 9–a. Required of Juniors in Mechanic Arts. 2 credits: 2 laboratories.

11–c. Wood Work. A continuation of 10–b. Advanced cabinet making and furniture finishing, including also a study of various substances used in furniture finishing. Mr. Batchelder.

Prerequisite: Shop 10–b. Required of Juniors in Mechanic Arts. 2 credits: 2 laboratories.

19–c. Wood Shop. Instruction in the care and use of tools in farm carpenter shop; saw filing; the making of various implements used on the farm; farm carpentry; use of steel square; laying out framing; care of lumber on the farm. Mr. Batchelder.

Required of Juniors in Agriculture. 2 credits: 2 laboratories.

21–c. Forging. This is a study of the operations necessary in the forging of iron and steel, and is designed to teach the methods of drawing, upsetting, welding, twisting, splitting, and punching of iron, also the hardening, tempering, and annealing of cast steel, and the case hardening of mild steel as adapted to the needs of the man who expects to teach the subject. Mr. McBride.

Required of Juniors in Mechanic Arts. 3 credits: 3 laboratories.

22–c. Machine Work. An elementary study of the operation of the principal machines suited to the chemist's needs. Mr. McBride.

Required of Seniors in Chemical Engineering. 3 credits: 3 laboratories.

23–a. Machine Work. Machine work arranged to meet the needs of students taking the Teacher Training course in Mechanic Arts. Mr. McBride.

Required of Seniors in Mechanic Arts. 3 credits: 3 laboratories.

24–b. **Machine Work.** A continuation of 23–a. Mr. McBride.

Prerequisite: Shop 23–a. Required of Seniors in Mechanic Arts. 3 credits: 3 laboratories.

25–c. **Machine Work.** A continuation of 24–b. Mr. McBride.

Prerequisite: Shop 24–b. Required of Seniors in Mechanic Arts. 3 credits: 3 laboratories.

26–a. **Practice Teaching.** Exercises, under supervision of the instructor, in teaching manual training in wood shop. Mr. Batchelder.

Required of Seniors in Mechanic Arts. 2 credits: 2 laboratories.

27–b. **Manual Training Practice.** A study of the principles of manual training, equipment of school shop, material to be used, subject-matter taught and method of presentation, as applied to grade schools. Mr. Batchelder.

Required of Seniors in Mechanic Arts. 2 credits: 1 recitation; 1 laboratory.

28–c. **Manual Training Practice.** A continuation of Shop 27–b as applied to high school work. Mr. Batchelder.

Prerequisite: Shop 27–b. Required of Seniors in Mechanic Arts. 2 credits: 1 recitation; 1 laboratory.

29–c. **Wood Work.** Advanced pattern making, involving split and loose piece patterns, core boxes, dry sand moulding, etc. Mr. Batchelder.

Required of Seniors in Mechanical and Electrical Engineering. 2 credits: 2 laboratories.

101–a. **Wood Work.** A continuation of 3–c; advanced pattern making, involving loose piece patterns, gated patterns, chills, dry sand mouldings, etc. Mr. Batchelder.

Prerequisite: Shop 3–c. Required of Sophomores in Architectural Construction and Mechanic Arts. 2 credits: 2 laboratories.

102–b. **Wood Work.** Architectural and cabinet wood turning; spindle, chuck, and face plate work. Mr. Batchelder.

Required of Sophomores in Architectural Construction and in Mechanic Arts. 2 credits: 2 laboratories.

103–c. **Wood Work.** Carpentry and building; including the laying out of foundations, rafters, stair stringers, trusses and the construction of buildings. Also a study of the common woods used in buildings. Mr. Batchelder.

Required of Sophomores in Architectural Construction and in Mechanic Arts. 2 credits: 2 laboratories.

104–a. Forging. Forging of iron and steel, and the operations of drawing, upsetting, welding, twisting, splitting and punching of iron. Also the hardening, tempering and annealing of cast steel, and the case hardening of mild steel. Mr. McBride.

Required of Sophomores in Mechanical and Electrical Construction. 2 credits: 2 laboratories.

105–b. Machine Work. Exercises in bench work, chipping, filing and scraping, and the layout of work from drawings. A study of cutting edges and tool adjustments best suited for different metals, together with a study of the cutting speeds and feeds. Practice in operating the drill press and in simple lathe work. Mr. McBride.

Required of Sophomores in Mechanical and Electrical Construction. 2 credits: 2 laboratories.

106–c. Machine Work. A continuation of 105–b. Mr. McBride.

Prerequisite: Shop 105–b. Required of Sophomores in Mechanical and Electrical Construction. 2 credits: 2 laboratories.

107–a. Machine Work. Advanced lathe work; also practice in the use of the milling machine, planer, shaper, and grinder. Mr. McBride.

Required of Juniors in Mechanical and Electrical Construction. 2 credits: 2 laboratories.

108–b. Machine Work. Manufacture of some machine, using more advanced methods and special tools. Mr. McBride.

Required of Juniors in Mechanical and Electrical Construction. 2 credits: 2 laboratories.

109–c. Machine Work. A continuation of 108–b. Mr. McBride.

Prerequisite: Shop 108–b. Required of Juniors in Mechanical and Electrical Construction. 2 credits: 2 laboratories.

PHYSICAL EDUCATION

PHYSICAL EDUCATION FOR MEN

WILLIAM H. COWELL, *Head of Department and Coach*
—— ——, *Instructor*

Aims.—1. To promote regulated exercise, and to provide an incentive and opportunity for every student to receive physical recreation.

2. To secure good posture, a uniform development and a reasonable amount of bodily skill and grace.

3. To stimulate the habit of exercise.

Equipment.—The gymnasium affords fine accommodation for training and indoor games.

On the first floor are the lockers and various shower baths.

On the second floor are the offices and the main gymnasium hall, which is 90 x 45.

On the third floor is the running track, the popular College Club Room containing comfortable lounging quarters, billiard and pool tables, for the use of the men students.

An athletic field adjoins the gymnasium. The field is equipped with a one-fourth mile cinder track, baseball and football field and other necessary features.

Requirements.—Unless excused by proper authority, all men students in the freshman and sophomore classes are required to complete the prescribed work in Physical Education.

Students physically unfit and students working their way through college may be excused.

A regulation gymnasium suit, the cost of which is about two dollars, must be worn.

All entering men students are examined, measured and a chart made for corrections, which affords a comparison of the student's own measurements with those of the nearly ideal, stimulating a personal interest in correcting any abnormality that may be present.

51-a. Physical Education. General setting up exercises and outdoor work.

Required of Freshmen. ½ credit: 2 hours' work.

52-b. Physical Education. Continuation of 51-a and indoor classes.

Required of Freshmen. ½ credit: 2 hours' work.

53-c. Physical Education. Elementary gymnasium exercises and field practices.

Required of Freshmen. ½ credit: 2 hours' work.

54–a. Physical Education. Gymnasium apparatus exercises and outdoor field games. Three lectures on intercollegiate football.

Required of Sophomores. ½ credit: 2 hours' work.

55–b. Physical Education. Indian club and dumb bell exercises, including indoor games. Three lectures on intercollegiate basket-ball.

Required of Sophomores. ½ credit: 2 hours' work.

56–c. Physical Education. Gymnasium and field practices. Three lectures on field games.

Required of Sophomores. ½ credit: 2 hours' work.

PHYSICAL EDUCATION FOR WOMEN

HELEN BARTLETT, *Instructor*

1–a. Physical Education. Outdoor athletic games; general developing exercises; corrective gymnastics.

Required of Freshmen. 1 credit: 2 hours' work.

2–b. Physical Education. Corrective gymnastics; light gymnastics with hand apparatus; figure marching; folk dancing; games.

Required of Freshmen. 1 credit: 2 hours' work.

3–c. Physical Education. A continuation of 2–b including field athletics.

Required of Freshmen. 1 credit: 2 hours' work.

4–a. Physical Education. Outdoor athletic games; corrective gymnastics; folk dancing.

Required of Sophomores. 1 credit: 2 hours' work.

5–b. Physical Education. Corrective exercises; gymnastic marching; light gymnastics with hand apparatus; technique of aesthetic movement; simple aesthetic and character dances; elementary work on heavy apparatus.

Required of Sophomores. 1 credit: 2 hours' work.

6–c. Physical Education. A continuation of 5–b including field games and athletics.

Required of Sophomores. 1 credit: 2 hours' work.

7–a. Physical Education. Outdoor athletic games; corrective exercises.

Required of Juniors. 1 credit: 2 hours' work.

8–b. **Physical Education.** Swedish gymnastics; gymnastic games; advanced technique of aesthetic movement; aesthetic, national and interpretative dances; elementary work on heavy apparatus.

Required of Juniors. 1 credit: 2 hours' work.

9–c. **Physical Education.** A continuation of 8–b including field games and athletics.

Required of Juniors. 1 credit: 2 hours' work.

10–a. **Physical Education.** Outdoor athletic games.

Elective for Seniors. 1 credit: 2 hours' work.

11–b. **Physical Education.** Normal course in play as carried on in the school room and on the playground.

Elective for Seniors. 1 credit: 2 hours' work.

12–c. **Physical Education.** Field games and athletics.

Elective for Seniors. 1 credit: 2 hours' work.

13–a. **Personal Hygiene.** A short study of the laws of health; the means of improving the physical and mental efficiency of the body; individual responsibility for race progress.

Required of all women Freshmen. 2 credits: 2 recitations.

MILITARY ARTS

HARVARD M. HALLS, *Major*
JAMES HAYES, *Sergeant*
GUSTAVE WOLFF, *Sergeant*

The object of military instruction is to qualify students for the performance of the duties of commissioned officers.

The courses are required of freshmen and sophomores, and elective for juniors, seniors and graduate students.

Exemptions or permission to be absent, except for physical disability, cannot be accorded to freshmen and sophomores; and any student who is absent from any part of the instruction will be required, subsequently, to make up the omitted training or its equivalent before being credited with the number of units necessary for graduation.

Reserve Officers' Training Corps

All physically fit male students entering college, unless excused for proper cause by the college authorities, are members of the Reserve Officers' Training Corps. The first two years of military training in this or any equivalent institution constitute the Basic Course. Such men as show a proper interest in the Basic Course may be selected for further training by the President of the College and the Professor of Military Science. The advance course consists of the third and fourth years of military training.

For all men in the R. O. T. C. the government furnishes the following equipment without cost to the student.

Each man will receive the following:

1 U. S. Rifle, model 1917.
1 Bayonet.
1 Scabbard.
1 Gun sling.
1 Cartridge belt (web).
1 Pack carrier.
1 Haversack.
1 First aid pouch.
1 Bacon can.
1 Canteen.
1 Canteen cover.
1 Condiment can.
1 Cup.
1 Knife.
1 Fork.
1 Spoon.
1 Meat can.

1 Coat, wool, O. D.	$9.79
1 Breeches, wool, O. D.	6.32
1 Shoes, russet or marching, pair	4.65
1 Shirt, wool, O. D.	3.50
1 Overcoat	13.56
1 Leggins, canvas, pair	1.05
1 Hat	2.00
2 Collar ornaments	.07
1 Hat Cord, R. O. T. C.	.09
1 Belt	.23
Total value	$41.26

Those students who are selected for the advance course and who agree to attend the Summer Training Camps during the summer vaca-

tions following the completion of their junior and senior years are given an allowance of 40 cents a day as commutation of subsistence. This allowance is paid quarterly and covers the two years at college during membership in the advanced course. This amounts to approximately $118 in cash a year.

The student is not required by reason of membership in the Reserve Officers' Training Corps to enter into any agreement to continue in college a definite length of time. He has the same liberty to leave college as though he were not a member. In order to receive the commutation of subsistence during the advanced course, he must agree to attend two summer training camps for a period of four weeks each providing he remains in college. These camps, in the regular order, will come at the end of his third and fourth years of military training. It may be possible, however, under certain regulations, to substitute camps at the end of the first and second year for the required camps in the advanced course.

The summer training camps are organized by bringing together the students from the different colleges which maintain units of the R. O. T. C. These camps will be most interesting and instructive. The government makes an additional allowance for clothing to men who attend. It also furnishes them transportation to and from the camp of instruction, or mileage therefor at the rate of 4 cents a mile. Excellent food is provided. Moral conditions are carefully controlled by the regular army officers in charge. In short, the camps, together with the other military instruction the student gets, not only offer opportunity for his physical and mental development, but offer it at no expense to him.

It is presumed that each member of the Reserve Officers' Training Corps will have taken before graduation at least one course or equivalent credit in either French, or German, or Spanish.

Special courses can no doubt be arranged from time to time to assist in developing specialists for duties other than those prescribed for reserve officers of the mobile army.

COURSE OF TRAINING FOR INFANTRY UNITS OF THE SENIOR DIVISION

No credit in Military Art shall be given toward graduation for completion of less than the three terms of each year in which it is elected.

1-a. **Military Art.** Practical. Weight 10. Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include the School of the Soldier, Squad, and Company, close and extended order. Theoretical.

Theoretical. Weight 4. Military organization (Tables of Organization); map reading, theory of target practice.

Required of Freshmen. 1½ credits: 1 recitation; 3½ hours' drill.

2-b. **Military Art.** Practical. Weight 10. Physical drill (Manual of Physical Training—Koehler); preliminary instruction sighting position and aiming drills, gallery practice, nomenclature and care of rifle and equipment. First aid instruction.

Theoretical. Weight 4. Service of security, personal hygiene, theory of target practice, individual and collective (use of landscape targets made up by U. S. Military Disciplinary Barracks, Fort Leavenworth, Kans.), camp sanitation for small commands.

Required of Freshmen. 1½ credits: 1 recitation. (Drill required for this subject is given during the fall and spring terms.)

3-c. **Military Art.** Practical. Weight 10. Physical drill (Manual of Physical Training—Koehler); infantry drill (U. S. Infantry Drill Regulations), to include School of the Battalion, special attention devoted to fire direction and control; ceremonies; manuals (Part V, Infantry Drill Regulations); Bayonet combat; intrenchments (584–595, Infantry Drill Regulations), range practice.

Theoretical. Weight 4. Lectures, general military policy as shown by military history of United States and military obligations of citizenship; service of information; combat (to be illustrated by small tactical exercises); United States Infantry Drill Regulations, to include School of the Company.

Required of Freshmen. 1½ credits: 1 recitation; 3½ hours' drill.

4-a. **Military Art.** Practical. Weight 10. Physical drill (Manual of Physical Training—Koehler); infantry drill to include School of Company and Battalion, close and extended order ceremonies (Part IV, Infantry Drill Regulations), combat firing.

Theoretical. Weight 4. United States Infantry Drill Regulations, to include School of the Battalion and combat (350–622); Small-Arms Firing Regulations; lectures, general military policies as shown by military history of the United States and military obligations of citizenship.

Required of Sophomores. 1½ credits: 1 recitation; 3½ hours' drill.

5-b. **Military Art.** Practical. Weight 10. Physical drill (Manual of Physical Training—Koehler); infantry drill to include School of the Company (close order), signaling, semaphore and flags, first aid. Work on sand table by constructing to scale, intrenchments, field works, obstacles, bridges, etc., comparison of ground forms (constructed to scale) with terrain as represented on map. Indoor range practice.

Theoretical. Weight 4. Map reading, camp sanitation, and camp expedients, military history (recent), patrols, etc.

Required of Sophomores. 1½ credits: 1 recitation. (Drill required for this subject is given during the fall and spring terms.)

6–c. Military Art. Practical. Weight 10. Physical drill (Manual of Physical Training—Koehler) infantry drill to include School of Company, Battalion and Regiment, ceremonies, trenches (outdoors). Range practice (outdoors), combat firing, bayonet combat, marches.

Theoretical. Weight 4. Service of security and information (illustrated by small tactical problems in patrolling, advance guards, rear guards, flank guards, trench and mine warfare, orders, messages, and camping expedients); marches and camps (Field Service Regulations and Infantry Drill Regulations).

Required of Sophomores. 1½ credits: 1 recitation; 3½ hours' drill.

7–a. Military Art. Practical. Weight 13. Duties consistent with rank as cadet officers or non-commissioned officers in connection with practical work and exercises laid down for the unit or units. Military sketching. Physical drill (Manual of Physical Training—Koehler).

Theoretical. Weight 11. Minor tactics; field orders (studies in minor tactics, United States School of the Line); map maneuvers· Weight 8. Company administration, general principles (paper and returns). Weight 1. Military history. Weight 2.

Elective for Juniors. 3 credits: 2 recitations; 3½ hours' drill.

8–b. Military Art. Practical. Weight 13. Physical drill (Manual of Physical Training—Koehler); Military Sketching. Duties consistent with rank as cadet officers or non-commissioned officers in connection with practical work and exercises laid down for the unit or units.

Theoretical. Weight 11. Minor tactics (continued); map maneuvers. Weight 8. Elements of international law. Weight 2. Property accountability; method of obtaining supplies and equipment (Army Regulations). Weight 1.

Elective for Juniors. 3 credits: 2 recitations. (Drill for this subject is given during the spring and fall terms.)

9–c. Military Art. Practical. Weight 13. Duties consistent with rank as cadet officers or non-commissioned officers in connection with the practical work and exercises scheduled for the unit or units. Military sketching. Physical drill (Manual of Physical Training—Koehler). Theoretical. Weight 13. Army paper work (New forms).

Elective for Juniors. 3 credits: 2 recitations; 3½ hours' drill.

10–a. Military Art. Practical. Weight 13. Duties consistent with rank as cadet officers or non-commissioned officers in connection with the practical work and exercises scheduled for the unit or units. Military sketching. Physical Training (Manual of Physical Training—Koehler).

Theoretical. Weight 11. Tactical problems, small forces, all arms combined; map maneuvers, court-martial proceedings (Manual of Courts-martial). International relations of America from discovery to present day; gradual growth of principles of international law embodied in American diplomacy, legislation, and treaties.

Elective for Seniors. 3 credits: 2 recitations; 3½ hours' drill.

11-b. **Military Art.** Practical. Weight 13. Military sketching, physical training (Manual of Physical Training—Koehler). Duties consistent with rank as cadet officers and non-commissioned officers in connection with the practical work and exercises scheduled for the unit or units.

Theoretical. Weight 11. Lectures: Psychology of war and kindred subjects. General principles of strategy only, planned to show the intimate relationship between the statesman and the soldier (not to exceed 7 lectures).

Elective for Seniors. 3 credits: 2 recitations. (Drill for this subject is given during the spring and fall terms.)

12-c. **Military Art.** Practical. Weight 13. Military sketching, physical training (Manual for Physical Training—Koehler). Duties consistent with the rank of cadet officers and non-commissioned officers in connection with the practical work and exercises scheduled for the unit or units.

Theoretical. Weight 11. Tactical problems (*continued*); map maneuvers. Rifle in war. Lectures on military history and policy; events of late war.

Elective for Seniors. 3 credits: 2 recitations; 3½ hours' drill.

COAST ARTILLERY UNIT

New Hampshire College expects to offer for the first time beginning with September 1919, a course of instruction for the Coast Artillery Unit. Special subject matter will be included in the subject of physics, mathematics, and mechanics, to meet the requirements of this course so that but little new subject matter will be necessary for students taking engineering.

The Government will furnish a staff of five men, 1 Officer, 1 Sergeant (with the training of a Sergeant Major), 1 Sergeant (Motor Mechanic), and 2 Privates (trained as Gun Mechanics or Motor Mechanics).

The Government will furnish the following equipment: One gun and limber, with accessories, of each of the following types: 155 mm. Gun (G. P. F.); 8″ Howitzer and platform; each type of trench mortar available; 1 Anti-aircraft gun and mount; 1-37 mm. Rifle.

Motor Transportation: 1-2-½ ton caterpillar tractor; 1-5 ton caterpillar tractor; 1-10 ton caterpillar tractor; 2 trucks, cargo, Q. M. C.; 2 motor cycles with side cars; 1 artillery repair truck.

THE TWO-YEAR COURSE IN AGRICULTURE

FREDERICK W. TAYLOR, *Dean*

This course, established by the state legislature in 1895, provides an opportunity for those students who do not have the time, money or preparation to take a four-year college course, to secure a training for their life work.

The course is specially arranged and suited for the young, bright boys of the farm, who expect to make a business of some branch of agricultural or horticultural work. Although it is open to students who have had no previous training on the farm, the entrance of such is not encouraged because of their lack of practical experience. By independent work and close application, however, inexperienced students sometimes pass the course with credit.

The year's work closes the last week in March, so as to enable the students to get home for the spring work on the farm or to accept other positions for the summer. This short school year also permits nearly six months' time for those students who are dependent upon their own resources to earn money for the following year.

The courses of study and the classes of the two-year course are separate and distinct from those of the four-year courses. The work of the first year is largely preparatory, being a study of the sciences underlying agriculture, together with some elementary agricultural and horticultural work. The second year contains optional studies, so that it is possible for students to specialize in animal husbandry, poultry, dairy husbandry, horticulture or forestry. Ten hours a week on the average are spent in practical work on the farm, in the barn, greenhouses, shops or forest.

Admission.—The course is open to those having a fair knowledge of reading, spelling, writing, arithmetic, English grammar, geography and history of the United States. Applicants under eighteen years of age, who do not present high school or other satisfactory certificates to show their

proficiency in these subjects, may be given entrance examinations on Tuesday afternoon and Wednesday morning of the opening week of college. Applicants who are over eighteen years of age will be admitted without examination.

Expenses.—The expenses of the course will vary with the taste and frugality of the students and the kind of accommodations which they secure. The total average expense for the year, if the student holds a scholarship, is not far from $300. Many students by working for their board or room rent, or by doing various kinds of work about the college or village, are able to go through the year with a cash outlay not exceeding $150. However, as a rule, such students are either men of exceptional physical alertness, or those who are quick to seize opportunity.

Graduation.—No degree is given at the end of the course, but a certificate of graduation is issued upon its completion or the completion of its equivalent.

Students graduating from the two-year course must present to the dean of the agricultural division on or before the second Tuesday preceding their graduation satisfactory evidence of having had practical experience in farm work, either through having lived on a farm for at least two years subsequent to the age of 12, or through having worked on a farm for at least four months subsequent to the age of 15.

Students graduating from this course in 1920 must have at least 72 credit hours.

TWO-YEAR COURSE OF STUDY

First Year

	First Term ("A")	Second Term ("B")
Grammar and El. Composition (Eng. 201–a, 202–b)	3	3
Elements of Botany (Bot. 201–a)	3	
Fungus Diseases of Plants (Bot. 202–b)		2
Chemistry (Chem. 201–a)	3	
Farm Dairying (D. H. 201–a)	3	
Fruit Growing (Hort. 201–a)	3	
Physiology and Hygiene (Zool. 201–a)	3	
Types and Breeds (A. H. 201–b)		4
Agricultural Drawing (Draw. 201–b)		2
Economic Entomology (Ent. 201–b)		3
Forge (Shop 202–b)		1
Wood Work (Shop 201–b)		2
Military Art (M. A. 1–a, 2–b)	1½	1½
Physical Education	½	½
	20	19

Second Year

Farm Equipment (Agron. 201–a)	3	
Soils (Agron. 203–b)		3
Field Crops (Agron. 202–a)	3	
Manures and Fertilizers (Agron. 204–b)		3
Farm Forestry (For. 201–a)	3	
Feeds and Feeding (A. H. 202–b)		3
Farm Poultry (P. H. 201–a)	3	
Elementary Physics (Phys. 201–b)		3
Military Art (M. A. 4–a, 5–b)	1½	1½
Physical Education (P. E. 54–a, 55–b)	½	½
Electives from subjects listed below	4	4
	18	18

Anatomy of Farm Animals (A. H. 203–a)	3	
Milk Production (D. H. 202–a)	3	
Buttermaking (D. H. 203–a)	3	
Dendrology (For. 2–a)	4	
Elementary Economics (Econ. 201–a)	3	
Vegetable Gardening (Hort. 202–a)	3	
Greenhouse Management (Hort. 203–a)	3	
Farm Management (Agron. 205–b)		3
Animal Diseases (A. H. 204–b)		3
Animal Breeding (A. H. 205–b)		3
Market Milk (D. H. 204–b)		3
Cheese and Ice Cream (D. H. 205–b)		4
Forest Mensuration (For. 6–b)		4
Home Decoration (Hort. 204–b)		3
Orchard Problems (Hort. 205–b)		2
Farm Poultry (P. H. 202–b)		3

*DESCRIPTION OF STUDIES OF TWO-YEAR COURSE IN AGRICULTURE

AGRONOMY

FREDERICK W. TAYLOR, *Professor*

201-a. **Farm Equipment.** This subject will include the mapping of farms, leveling for drains, a study of farm implements and of farm buildings. Practical exercises are given in map making, laying out drains, comparing farm machines, rope splicing, etc. Professor Taylor.

Required second year. 3 credits: 2 recitations; 1 laboratory.

202-a. **Field Crops.** Lectures and recitations on the culture, uses and value of the field crops grown in New England. Laboratory practice will include seed testing, seed identification, corn and potato judging, hay judging, and a study of the different legumes, grasses and grains. Assistant Professor Eastman.

Required second year. 3 credits: 2 lectures; 1 laboratory.

203-b. **Soils.** Text-book and recitations upon the physical and chemical properties of soils. The subject will be made as practical as possible in its application to farm work. Laboratory experiments will be performed to illustrate the principles studied. Assistant Professor Eastman.

Required second year. 3 credits: 2 recitations; 1 laboratory.

204-b. **Manures and Fertilizers.** Text-book and recitations upon the constituents of farm manures, the home-mixing of fertilizers, and the modifications required by different soils and crops. Professor Taylor.

Required second year. 3 credits: 3 lectures.

205-b. **Farm Management and Accounting.** Text-book, lectures and recitations upon different types of farming, size of farms, cropping systems, live-stock problems, marketing farm products, choice of a farm, and farm records and accounts. Practical work in laying out farms, keeping cost accounts on farms, and analyzing and organizing the farm business. Assistant Professor Eastman.

Elective second year. 3 credits: 2 lectures; 1 laboratory.

*Only Two-Year students in Agriculture are admitted to these courses, except by special arrangement with the Dean.

ANIMAL HUSBANDRY

201–b. Types and Breeds of Live Stock. A study of the different breeds of horses, cattle, sheep, and swine in respect to their origin, history, development, characteristics, and adaptability to different conditions of climate and soil. One afternoon each week is devoted to judging the different breeds. Assistant Professor Fawcett.

Required first year. 4 credits: 3 lectures; 1 laboratory.

202–b. Feeds and Feeding. An elementary study of the laws of nutrition, the character, composition, and digestibility of feed stuffs, and the methods of feeding different kinds of farm animals. Numerous samples of grains and by-products are used for the purpose of familiarizing the students with the different feed stuffs. Practice is given in calculating rations for various purposes. Assistant Professor Fawcett.

Required second year. 3 credits: 2 recitations; 1 laboratory.

203–a. Anatomy of Farm Animals. Lectures and recitations upon the form and structure of the domesticated animals. Skeletons, various anatomical specimens, models, charts, and lantern slides are used to make the subject as practical as possible. The purposes of this subject are to show the relation between the skeleton and the form and function of the animal, and to serve as a foundation for the intelligent study of animal diseases and ailments. Professor Eckman.

Elective. 3 credits: 2 recitations; 1 laboratory.

204–b. Animal Diseases. A study of some of the more common economic infectious and non-infectious diseases of farm animals, their prevention and their treatment. Professor Eckman.

Elective. 3 credits: 2 recitations; 1 laboratory.

205–b. Animal Breeding. A study of the principles and practices of animal breeding. Practice is given in tracing pedigrees. Assistant Professor Fawcett.

Elective second year. 3 credits: 2 recitations; 1 laboratory.

BOTANY

201–a. Elements of Botany. In this subject the student is given a succinct account of the form and structure of plants and of how plants grow and feed.

Required first year. 3 credits: 1 lecture; 2 laboratories.

202–b. Fungous Diseases of Plants. The principal fungous diseases, their cure and their prevention. Associate Professor Werkenthin.

Required first year. 2 credits: 1 lecture; 1 laboratory.

CHEMISTRY

201–a. Elementary Applications. An elementary study, with special reference to the elements of plant food, composition of fertilizers, elements subject to exhaustion in soils, etc. Mr. Fogg.

Required first year. 2 credits: 2 recitations.

DAIRY HUSBANDRY

201–a. Farm Dairying. A general survey of the field of dairy husbandry. Such topics as the use of the Babcock test, farm separators, farm buttermaking and farm cheesemaking, and marketing dairy products, are included. Mr. DePew.

Required first year. 3 credits: 2 lectures; 1 laboratory.

202–a. Milk Production. The field of dairy husbandry in its relation to the producer. Feeding dairy animals; systems of herd feeding; silage and soiling; raising dairy animals; dairy herd development; dairy barns; advanced registry management; fitting dairy animals for show; dairy cattle judging. Professor Fuller.

Elective second year. 3 credits: 2 lectures; 1 laboratory.

203–a. Buttermaking. A study of the secretion and of the chemical and physical properties of milk; pasteurization; cream ripening, starters, churning; organization and operation of factories. Mr. DePew.

Elective second year. 3 credits: 2 lectures; 1 laboratory.

204–b. Market Milk. Food value of milk; production, handling and distributing of market and certified milk; dairy farm inspection; control of milk supply. Mr. DePew.

Elective second year. 3 credits: 2 lectures; 1 laboratory.

205–b. Ice Cream and Cheesemaking. (1) Lectures and laboratory work covering the manufacture of the more important types of cheese. (2) The making, handling, and marketing of ice cream and ices. Mr. DePew.

Elective second year. 4 credits: 2 lectures; 2 laboratories.

ARCHITECTURE AND DRAWING

201–b. Agricultural Drawing. A brief study of the use of drafting instruments, followed by sketches and working drawings of wood and concrete construction as applied to farm mechanics and farm buildings. Mr. Laton.

Required second year. 2 credits: 2 drawing periods.

ECONOMICS

201–a. Introduction to Agricultural Economics. Attention will be given to the essentials of Agricultural Economics as well as to the underlying principles of economics in general. Principles which determine the value of commodities, the rent of land, the wages of labor and the interest of capital, will be considered. Lastly, attention will be given to money and banking in their relation to the industry of agriculture. Assistant Professor McKay.

Required second year. 3 credits: 1 lecture; 2 recitations.

ENGLISH

201–a. Grammar and Elementary Composition. Professor Richards.

Required first year. 3 credits: 3 recitations.

201–b. Grammar and Elementary Composition. A continuation of 201–a. Professor Richards.

Prerequisite: English 201–a. Required first year. 3 credits: 3 recitations.

ENTOMOLOGY

201–b. Principles of Economic Entomology. The relation of the structure and classification of insects to methods of insect control. The preparation and application of insecticides. Spray machinery and appliances. Professor O'Kane and Assistant Professor Cleveland.

Required first year. 3 credits: 2 recitations; 1 laboratory.

FORESTRY

201–a. Farm Forestry. The care and management of farm woodlots; log and board sealing; logging and milling; estimating standing timber; protection from fire, insects, fungi, etc.; thinning immature stands; seeding and planting; natural regeneration. Professor Woodward.

Required second year. 3 credits: 2 lectures; 1 laboratory.

HORTICULTURE

201–a. Fruit Growing. This subject embraces a study of commercial orcharding. Each fruit is studied with reference to planting, cultivating, pruning, fertilizing, picking, packing, storing and marketing. Associate Professor Wolff.

Elective first year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

202–a. Vegetable Gardening. A study of the commercial methods of vegetable growing. Special attention is given to the home garden. Assistant Professor Hepler.

Elective second year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

204–b. Home Decoration. A study of ornamental trees, shrubs and flowers; their culture, proper arrangement and decorative value, with special reference to the home surroundings. Assistant Professor Hepler.

Elective second year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

205–b. Orchard Problems. This subject deals with the principal problems of farm and commercial orchard management. It is designed to show the application of the principles of fruit growing to practical conditions. Professor Gourley.

Elective second year. 2 credits: 2 lectures.

203–a. Greenhouse Management. Combined lecture, demonstration and laboratory work in greenhouse management. Assistant Professor Hepler.

Elective second year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

POULTRY

201–a. Farm Poultry. A general subject designed especially for Two-Year students who are going back to the farm to take up practical poultry work. The subject will include work in managing, feeding, housing, breeding, incubation, brooding, and marketing, with laboratory work as practical as can be made. Associate Professor Richardson.

3 credits: 2 lectures; 1 laboratory.

202–b. Farm Poultry. Continuation of 201–a. Associate Professor Richardson.

3 credits: 2 lectures; 1 laboratory.

PHYSICS

201–b. Elementary Physics. The application of mechanics, heat and electricity to the more important practical devices. The laboratory work will consist of experiments in the laws of physics. Professor Howes.

3 credits: 2 recitations; 1 laboratory.

SHOP WORK

201–b. Wood Work. Farm carpentry and joinery. Care use of tools, making of implements for the farm, and care of lumber on the farm. Mr. Batchelder.

Required first year. 2 credits: 2 laboratories.

202–b. Forging. This is a study in the forging of iron and steel and is designed to teach the operation of drawing, upsetting, welding,

twisting, splitting, and punching. A study is made of the construction, care and management of the forge and instruction is given in tempering, case hardening and annealing.

Required first year. 1 credit: 1 laboratory.

ZOÖLOGY

201-a. **Human Anatomy and Physiology.** A general survey of the structure and physiology of the human body. The most important principles of hygiene will be pointed out from time to time as various systems are discussed. Mr. ——.

Required first year. 3 credits: 3 lectures.

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION AND EXTENSION SERVICE

JOHN C. KENDALL, *Director*

EXPERIMENT STATION

Most of the agricultural experiment stations of the country, including the New Hampshire station, were founded in 1888 by an act of congress, approved March 2, 1887, known as the Hatch act, in honor of its author. This act appropriated fifteen thousand dollars ($15,000) annually for the maintenance of an agricultural experiment station in each state. This act provides:

"That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural and artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories." The act also provides that the results of such work shall be published in bulletins and reports.

A further endowment of the experiment stations with federal funds to provide specifically for research work was made by the Adams act, passed by congress and approved

March 16, 1906. The appropriation received under the provision of the Adams law now amounts to $15,000 each year. This appropriation is specifically limited to the "necessary expenses of conducting original researches or experiments," and the rulings of the United States Department of Agriculture, which is vested with the supervision of the expenditures under this act, require that this appropriation be spent in fundamental investigations or researches to determine the underlying causes and principles of agricultural science, rather than for mere experiments to secure results of immediate practical application as contemplated under the Hatch Act appropriation. The purposes of the two acts are, therefore, supplementary but distinct.

The New Hampshire Agricultural Experiment Station is organized as a department of the New Hampshire College of Agriculture and the Mechanic Arts, and is administered by a board of control, elected by its board of trustees.

The publications of the station comprise 190 bulletins of the regular series and 19 circulars, 13 technical bulletins, 11 scientific contributions, and 4 school bulletins. The bulletins are issued at irregular intervals and are sent to all residents of New Hamsphire requesting them. The station has a mailing list of 23,000 addresses. Back numbers will be sent as long as the supply lasts. Lists of available publications will be sent upon requests.

The above quotations taken from the Hatch and Adams acts are sufficient to indicate the true function of this and other experiment stations called into being by the passage of those laws. At first the experiment stations found it difficult to resist the popular demand made upon them to enter the extension field, to the neglect of research, but it is to the credit of the officials having the directing and executing of those laws in charge that our stations have proved true to their trust. If the stations had not devoted their energies to the fields of original research our agriculture could not possibly be upon the high plane which it occupies today.

The introduction of the extension service as a recognized part of the work of this and other similar institutions only serves to emphasize the importance of experiment station work. In our haste to produce immediate results we sometimes lose sight of the value of the work of our experiment stations. We do not realize the debt agriculture owes to the scientists who are willing to devote their life work to the study of one subject, or at most a very few subjects, without thought of personal ambition and advancement, but simply seeking after truth and the advancement of science.

EXTENSION SERVICE

Under the provisions of an act of congress approved May 8, 1914, New Hampshire, the same as every other state, receives the sum of $10,000 annually from the federal government for supplementing and strengthening the extension work of the Agricultural College.

In addition to the annual appropriation of $10,000, each state shares in increased allotments for seven years in the proportion which the rural population of each state bears to the total rural population of all the states as determined by the next preceding federal census, provided the state shall appropriate an equal sum. If New Hampshire fulfills her part in carrying out the provisions of the Smith-Lever law, the state will receive in 1922–23 and thereafter, from the federal government, annually the sum of $24,572, for conducting coöperative demonstration work in agriculture and home economics.

This financial assistance from the federal government comes to New Hampshire at a time when state and other funds are inadequate for meeting the demands which are constantly being made upon the college, and will make it possible for the extension service to strengthen and develop its work along all lines and render a still greater service to the state.

The organization of a distinct department or division of extension service in connection with our state colleges and

universities gives proper recognition to a threefold function; viz., teaching resident students, conducting investigations, and carrying information and assistance from the college and station into all parts of the state.

The extension service with its own corps of forty-nine men and women relieves the college teaching staff and station workers from much of the miscellaneous extension work which they, of necessity, have been compelled to carry on in the past.

This new organization permits the selection and assigning of such duties to the individual as he or she seems best fitted to perform, which will work for efficiency in all three departments or divisions. We have the Smith-Lever law to thank for hastening the time of bringing these things to pass.

The United States Department of Agriculture has created what is known as the States Relations Service to take charge of and coöperate with the several states in carrying out the provisions of the Smith-Lever law. Having the extension work of each state closely associated with the work of the United States Department of Agriculture through the States Relations Service is a very potent factor in unifying and strengthening the extension work throughout the United States.

The last few years have witnessed a remarkable growth in the development of improved methods of teaching agriculture. There has been a decided change in the attitude of the public toward the work of institutions offering training in agriculture, which has rendered possible the unprecedented progress actually made by state institutions where agriculture is being taught.

The extension service is intended to serve as a medium by which to take the teaching of the college classroom and the results derived from the experiment station fields and laboratories directly to the homes and to the fields of the farmers of the state. It is very difficult to place any just estimate upon the value of such service to a state or to the nation. It is recognized today as never before that upon the prosperity of the farmer depends quite largely the

general prosperity of all classes of people. The present high cost of living has done much to attract the attention of people to the relation which the farmer and his interests bear to them personally.

What the colleges and universities are to those young men and young women who come within their walls, the extension service is, only to a lesser degree, to the thousands who are beyond the reach of the classroom.

DEGREES AND HONORS, 1918

HONORARY DEGREES

Henry W. Keyes, LL.D.
Huntley N. Spaulding, D.Sc.
John B. Jameson, D.Sc.
James Mortimer Leonard, M.S.

BACHELOR OF SCIENCE

Agricultural Division

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Maurice Haynes Benson . . . . . Lebanon
Ralph deRochemont Brackett . . . . . Greenland
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Charles Higgins Coburn . . . . . Tyngsborough, Mass.
Stanley Hatch Dalton . . . . . Nashua
Otis Raymond Garland . . . . . Hampton
Fred William Hall . . . . . Center Strafford
Ernest Winfield Hardy . . . . . Contoocook
John Edwin Humiston . . . . . Hanover Center
Raymond Walch Hutchinson . . . . . Reed's Ferry
Howard Thompson Irvine . . . . . Exeter
Weston Harvey Jeffers . . . . . Pike
Rodney Solon Jenkins . . . . . Barnstead
Lester Edwin Merrill . . . . . Lebanon
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Earl Louis Scovell . . . . . Haverhill, Mass.
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Clarence Benjamin Wadleigh . . . . . Newton
Norman Francis Whippen . . . . . Kingston
Howard Willand . . . . . East Wolfeboro
Claiborne Hart Young . . . . . Wilton

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Helen Marion Bugbee . . . . . Claremont
Mary Olive Cushing . . . . . Concord
Josephine Marguerite Furber . . . . . Laconia

Ruth Whitney Hadley.....Durham
Florence Julia Harris.....Laconia
Martha Luena Hoitt.....Durham
Irene Meyers Huse.....Laconia
Della May Ingerson.....Starrking
Elsie Louise King.....Dover
Erma Masso Lary.....Berlin
Raymond Soule Morrill.....Warren
Ralph Poor Nevers.....Salem, Mass.
Ethel May Walker.....Concord

Engineering Division

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Richard Cilley Bartlett.....Derry Village
Rodney Clyde Coburn.....Lowell, Mass.
James William Dodge.....Contoocook
Louis Dreller.....Portsmouth
Charles Butterworth Durgin.....Wilton
Heman Charles Fogg.....Concord
Maurice Channing George.....Danville
Merton Burgess Lane.....Ashburnham, Mass.
Elmer Nason Sanders.....Durham
Archie McQuesten Spencer.....Plymouth
Robert Chapman Stimson.....New London
Rollins Wentworth.....Dover

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Reginald Foster Cahalane.....Walpole
Malcolm Barrett Clark.....Bethlehem
Eva Emma Eastman.....Concord
Mildred Margaretta Flynn.....Dover
Edith Emily Foss.....Dover
Marion Susan Gilson.....Windham
Lucille Adeline Gove.....Durham
Hilbert Goodrich Hewey, Jr.....Lewiston, Me.
Joel William Hofstead.....Winchendon, Mass.
Fred John Howe.....Exeter
Russell Cyprian Jones.....Exeter
Marguerite Mae Merrill.....Nashua
John Joseph Parsons.....Somersworth
Clesson Willard Richardson.....Marlborough
Susan Helen Scott.....Durham
Hazel Searles Winn.....Dover

TWO YEAR CERTIFICATES IN AGRICULTURE

Herman Russell Fletcher.....Plymouth
George Webster Harris.....Pelham
Orton Francis Hill.....Warner
William Henry Irvine.....Exeter
Bleecker Lloyd Wagner.....Waban, Mass.
Earl Cass Whipple.....Goffstown

As of the Class of 1917

Edwin John Andrew.....Concord

HONOR LIST FOR 1918

SPECIAL HONOR

Average of 90 or more for the year's work

1918

Heman Charles Fogg.
Russell Cyprian Jones.
Hazel Searles Winn.

1919

Dorothy Hanson.
Frank Adin Joy.

1920

Esther Lucile Brown.
Margaret Sullivan Cote.

1921

Mary Anne Catherine Boyd.
Louise Burdette.
Harriet May Ford.
Eleanor Frances Leahy.
Dorothy Pauline Wentworth.

HONOR

Average of 85 or more for the year's work

1918

Eloi Augustus Adams.
Malcolm Barrett Clark.
Eva Emma Eastman.
Mildred Margaretta Flynn.
Edith Emily Foss.
Josephine Marguerite Furber.
Marion Susan Gilson.
Ruth Whitney Hadley.
Florence Julia Harris.
Joel William Hofstead.
Martha Luena Hoitt.
Irene Meyers Huse.
Elsie Louise King.
Elmer Nason Sanders.
Susan Helen Scott.
Ethel May Walker.
Rollins Wentworth.
Claiborne Hart Young.

1919

Muriel Chamberlin.
Mary Robinson Cressey.
Otto Winfred Davis.
Cecil Calvert Dustin.
Alice Bowdoin Kemp.
Frank William Prescott.
Miriam Augusta Sanders.
William Crawford Wheeler.

1920

Helen Miller Barton.
John Jacob Bloomfield.
Harry Jonathan Harling.
Ethelle Meserve Hayes.
Florence Aura Kelley.
Frances Kling.
Chester Allen Scammon.
Jennie Mae Shannon.
Phebe Key Stryker.

1921

Gordon Roger Booth.
Dorothy Chase.
Fred Levi Chase.
Lillian Frances Curtis.
Rita Beatrice Fluet
Leland Elford Grant.
Florence Durkie Hatch.
Lyle Clayton Jenness.
Ernest Parker Little.
Donald Potter Mattoon.
Helen Hawkes Meader.
Dorothy Miller.
Janet Ward.
Edmund George Riel.

PRIZE RECORD FOR 1918

BAILEY PRIZE

Given by Dr. C. H. Bailey, Class of '79, and E. A. Bailey, Class of '85

Heman Charles Fogg, Concord.

ERSKINE MASON MEMORIAL PRIZE

Howard Thompson Irvine, Exeter.

CHASE-DAVIS MEMORIAL MEDALS

Gold Medal

Charles Bernard Broderick, Exeter.

Silver Medal

Howard Thompson Irvine, Exeter.

LILIAN S. EDWARDS PRIZE

Frances Kling, Concord.

VALENTINE SMITH SCHOLARSHIPS

John Jacob Bloomfield, '20, Dover.
Harriet May Ford, '21, South Danbury.
Edson Martin Bailey, '22, Sunapee.

ROSTER OF COMMISSIONED OFFICERS

BATTALION OF RESERVE OFFICERS' TRAINING CORPS

1918–1919

Commandant, Major Harvard N. Halls, U. S. A.

FIELD AND STAFF

Major B. F. Hills, *Commanding Battalion.*

COMPANY A

Captain T. R. Butler, *Commanding Company.*
First Lieutenant R. S. Coker, *duty with Company.*
Second Lieutenant W. E. Knox.

COMPANY B

Captain C. J. O'Leary, *Commanding Company.*
First Lieutenant Guy E. Plaistead, *duty with Company.*
Second Lieutenant Chas. W. Sheperd.

COMPANY C

Captain C. A. Scammon, *Commanding Company.*
First Lieutenant N. E. Meras, *duty with Company.*
Second Lieutenant S. L. Ajermian.

COMPANY D

Captain A. S. Baker, *Commanding Company.*
First Lieutenant G. W. Patten.
Second Lieutenant Geo. McKenzie.

STUDENTS, 1918–1919

The letter "A" following the names of students indicates that such students were members of the Army Section of the Students' Army Training Corps. The letter "N" following the names of students indicates that such students were members of the Navy Section of the Students' Army Training Corps. An asterisk before the "A" or "N" indicates that the student was in college only during the time he was a member of the Students' Army Training Corps. A double asterisk before the "A" or "N" indicates that the student applied for induction in the Students' Army Training Corps but was not inducted and that he failed to return to college for further work.

The abbreviations indicating the course stand for the following: *a. h.* and *d.*—Animal Husbandry and Dairy; *for.*—Forestry; *hort.*—Horticulture; *gen. a.*—General Agriculture; *a.*—Freshmen and Sophomores in Agriculture; *ch. e.*—Chemical Engineering; *m. e.*—Mechanical Engineering; *e. e.*—Electrical Engineering; *a.* and *s.*—General Arts and Science; *h. e.*—Home Economics; *m. a.*—Mechanic Arts.

SENIORS

Name	Section of S. A. T. C.	Course	P. O. Address
Ashford, Olive Irene		*h. e.*	*Dover.*
Atwood, Grace Etta		*a.* and *s.*	*Worcester, Mass.*
Baker, Margaret Edna		*h. e.*	*Littleton.*
Bartlett, Edward Emery	N	*m. e.*	*Derry.*
Belyea, Clement Chipman	A	*ch. e.*	*Newfields.*
Bennett, Charles Alfred		*a.* and *s.*	*Durham.*
Benson, Priscilla		*h. e.*	*Lebanon.*
Caswell, Henry Benson		*m. a.*	*Barnstead.*
Chamberlain, Muriel		*a.* and *s.*	*Berlin.*
Clapp, Arthur Everett		*a.* and *s.*	*Portsmouth.*
Cochrane, Thomas Joseph	N	*ch. e.*	*Ludlow, Mass.*
Cressey, Mary Robinson		*a.* and *s.*	*Dover.*
Davis, Otto Winfred		*a. h.* and *d.*	*Concord.*
Dimond, Blanche Farnum		*h. e.*	*West Concord.*
Doherty, Mildred Eva		*h. e.*	*Derry.*
Durgin, John Frank		*gen. a.*	*Newmarket.*
Dustin, Cecil Calvert		*a. h.* and *d.*	*Rochester.*
Garland, Oscar Leavitt		*a.* and *s.*	*Hampton.*
Glidden, Norman Frank		*gen. a.*	*Alton Bay.*
Grant, Christine Sutherland		*h. e.*	*Plymouth.*
Greenfield, Sara Ella		*a.* and *s.*	*Rochester.*
Hale, Dorothy Adaline		*a.* and *s.*	*Dover.*
Hall, Irene Marguerite		*a.* and *s.*	*Rochester.*

Name	Section of S.A.T.C.	Course	P. O. Address
Hanson, Dorothy		*a.* and *s.*	*Franklin.*
Hoffman, Louis Benjamin	A	*e. e.*	*Manchester.*
Hyde, Lincoln Spencer		*a. h.* and *d.*	*East Kingston.*
Joy, Frank Adin		*m. e.*	*Newfields.*
Kelleher, Mary Ethel		*a.* and *s.*	*Dover.*
Kemp, Alice Bowdoin		*h. e.*	*Kingston.*
Langley, Ada Caroline		*a.* and *s.*	*Durham.*
Lewis, Marion Anna		*h. e.*	*Littleton.*
McCarty, Mary Elizabeth Anna		*a.* and *s.*	*Dover.*
Matthes, Carl Frederick	N	*ch. e.*	*Lawrence, Mass.*
Moody, Alden Howard	A	*ch. e.*	*Concord.*
Nightingale, Gordon Thayer		*gen. a.*	*Moosup, Conn.*
Nudd, Willard Eugene	N	*m. e.*	*Hampton.*
Page, Oral Allen		*a. h.* and *d.*	*Newton.*
Perkins, Caroline May		*a.* and *s.*	*Claremont.*
Petmezas, Constantine A.		*a.* and *s.*	*Portsmouth.*
Pinkham, Madelene Lona		*h. e.*	*Dover.*
Poland, Mary Flora		*a.* and *s.*	*Lebanon.*
Prescott, Frank William		*a.* and *s.*	*Pittsfield.*
Randall, Christine Flora		*a.* and *s.*	*Campton.*
Richmond, Louise Mary		*a.* and *s.*	*Dover.*
Robb, Bernice Aurilla		*h. e.*	*Durham.*
Rogers, Walter Eugene		*a.* and *s.*	*Sanbornville.*
Rumrill, Hamilton		*m. a.*	*Hillsborough.*
Sanders, Miriam Augusta		*h. e.*	*Rochester.*
Seawards, Susie Ethel		*h. e.*	*Dover.*
Shedd, Hazelle Maude		*h. e.*	*Rochester.*
Shillaber, John James		*m. e.*	*Portsmouth.*
Shuttleworth, Melba Johnson		*a.* and *s.*	*West Springfield, Mass.*
Shuttleworth, William Edward		*a. h.* and *d.*	*Portsmouth.*
Sleeper, Clarence Wilson		*a.* and *s.*	*Concord.*
Smith, Gertrude May		*h. e.*	*Epping.*
Smith, Mabel Foster		*h. e.*	*Claremont.*
Stafford, John Fremont	A	*a.* and *s.*	*Berlin.*
Strain, Murray Hartshorn	A	*a.* and *s.*	*Groveton.*
Tilton, Lewis Blake	A	*a. h.* and *d.*	*East Kingston.*
Wakefield, Clement Arthur		*a.* and *s.*	*Biddeford, Me.*
Wetherbee, Emma Louise		*h. e.*	*Milford.*
Wheeler, William Crawford		*for.*	*Starrking.*
White, Alpheus Britton		*a.* and *s.*	*Peterborough.*
Wiggin, Ida Marion		*h. e.*	*Dover.*
Wildes, Karl Leland	N	*m. e.*	*Belmont.*
Williams, Katherine		*h. e.*	*Exeter.*

JUNIORS

Name	Section of S. A. T. C.	Course	P. O. Address
Abbott, Howard Stanley	N	*a.h.* and *d.*	*Wilton.*
Adams, Helen Gertrude		*h. e.*	*Farmington.*
Akerman, Wallace Sheldon		*e. e.*	*Portsmouth.*
Aldrich, Katherine Spurlin		*a.* and *s.*	*Whitefield.*
Bailey, Mary Elizabeth		*a.* and *s.*	*Durham.*
Banister, Rolfe George		*a. h.* and *d.*	*Colebrook.*
Barker, Forest Allen		*ch. e.*	*Nashua.*
Barton, Helen Miller		*h. e.*	*Seabrook.*
Bickford, Gladys Charlotte		*h. e.*	*Gonic.*
Billingham, George Harold	N	*m. a.*	*Boston, Mass.*
Binks, Doris Reba		*a.* and *s.*	*Franklin.*
Blood, Kenneth Darwin		*a. h.* and *d.*	*Claremont.*
Bloomfield, John Jacob		*ch. e.*	*Dover.*
Boutwell, Harley		*a.* and *s.*	*Concord.*
Brierley, Philip	*A	*a.* and *s.*	*Stratham.*
Brooks, Beatrice Azelia		*a.* and *s.*	*Dover.*
Brooks, Frank Arthur		*m. e.*	*Manchester.*
Brown, Arthur Butler		*a. h.* and *d.*	*Fremont.*
Brown, Esther Lucile		*a.* and *s.*	*Newfields.*
Browne, Winnifred Pearl		*a.* and *s.*	*Manchester.*
Bryant, Rachael Leone		*h. e.*	*Portsmouth.*
Burpee, Howard Ainsworth	A	*ch. e.*	*Manchester.*
Burleigh, Lucile Edna		*a.* and *s.*	*Franklin.*
Callender, Benjamin Richard	N	*ch. e.*	*Bethlehem.*
Carr, James Irvin		*ch. e.*	*Hancock.*
Chamberlain, A. Herbert	N	*ch. e.*	*South Natick, Mass.*
Clarke, Daniel Willatowski	A	*gen. a.*	*Schenectady, N. Y.*
Congdon, Neal Harrison	*A	*a.* and *s.*	*Lancaster.*
Cote, Margaret Sullivan		*a.* and *s.*	*Nashua.*
Cree, Leighton Joseph		*a. h.* and *d.*	*Colebrook.*
Cummings, Flora Belle		*h. e.*	*Colebrook.*
Currier, Maurice Emerson	A	*a.* and *s.*	*Dover.*
Davis, Arthur Franklin		*a.* and *s.*	*Portsmouth.*
Dearborn, Hazel Ruth		*a.* and *s.*	*Durham.*
Donahue, Helen Bernardine		*a.* and *s.*	*Waltham, Mass.*
Edgerly, Eva Hester		*a.* and *s.*	*Newmarket.*
Elkins, Dorice White		*h. e.*	*Hampton Falls.*
Emery, Henry Alfred	A	*m. e.*	*Auburn.*
Ewer, Everett Donald	*A	*a.*	*Dover.*
Felker, Harold Perkins	A	*a. h.* and *d.*	*Laconia.*
Fitch, Harold Wakefield	N	*for.*	*Claremont.*
Fitts, Perley Irving	A	*a. h.* and *d.*	*Etna.*

Name	Section of S.A.T.C.	Course	P. O. Address
Foster, Russell Chase	A	*m. e.*	*Fitchburg, Mass.*
Fox, Gordon Lloyd	*A	*a.* and *s.*	*Lisbon.*
Furber, Miriam Louise		*a.* and *s.*	*Wolfeboro.*
Gardner, Celia Hubbard		*a.* and *s.*	*Springfield.*
Gove, Norris Dickinson	N	*m. e.*	*Raymond.*
Greer, Raymond Chase		*a.* and *s.*	*Grasmere.*
Ham, Harold Rudman	A	*a. h.* and *d.*	*Durham.*
Harling, Harry Jonathan	A	*a. h.* and *d.*	*Jaffrey.*
Hayes, Ethelle Meserve		*h. e.*	*Dover.*
Herlihy, Abby Katherine		*a.* and *s.*	*Derry Village.*
Hill, William Rodney		*a.* and *s.*	*Concord.*
Hunt, Esther Hazel		*h. e.*	*Kennydale, Wash.*
Huse, Walter Daniels	A	*m. e.*	*Laconia.*
Jenness, Judith Varney		*a.* and *s.*	*Dover.*
Jenness, Leslie George	N	*ch. e.*	*South Danbury.*
Jones, Elizabeth		*a.* and *s.*	*Union.*
Jones, Lucie Jeanette		*a.* and *s.*	*Milton.*
Joy, Grace Mae		*a.* and *s.*	*Newmarket.*
Kelley, Florence Aura		*a.* and *s.*	*Plaistow.*
Kling, Frances		*a.* and *s.*	*Concord.*
Ladd, Harold Marden		*m. a.*	*Bristol.*
Lane, Chester Linwood	N	*ch. e.*	*Concord.*
Langley, Mildred Mae		*a.* and *s.*	*Durham.*
Lewis, Miriam		*a.* and *s.*	*Chester.*
McQuesten, Ruth Carolyn		*h. e.*	*Manchester.*
Melville, George Donald		*a.* and *s.*	*Hyde Park, Mass.*
Meserve, Jessica Frances		*h. e.*	*Dover.*
Morrill, Clyde Rex		*a.* and *s.*	*Dover.*
Morrison, Cecil Alister		*a.* and *s.*	*Rochester.*
Murphy, Helen Ann		*ch. e.*	*Portsmouth.*
Nelson, Daniel Horace	N	*m. a.*	*Franconia.*
Norris, Edith Priscilla		*h. e.*	*East Derry.*
O'Leary, Jr., Christopher James	A	*a.* and *s.*	*Newfields.*
Otis, Rena Frances		*a.* and *s.*	*Rochester.*
Patten, Gordon Willis		*a.* and *s.*	*Manchester.*
Patterson, Frank Edward		*a.* and *s.*	*Portsmouth.*
Paul, Samuel Henry		*m. e.*	*Wakefield.*
Perkins, Charles Gladstone		*e. e.*	*Portsmouth.*
Pichette, Edward Albert	*N	*e. e.*	*Concord.*
Pike, Otis William	N	*e. e.*	*Antrim.*
Pingree, George Nathan	N	*e. e.*	*New London.*
Plaisted, Guy Edgar	A	*e. e.*	*Portsmouth.*
Rice, Dorothy Frances		*h. e.*	*Dover.*

Name	Section of S.A.T.C.	Course	P. O. Address
Rice, Lee Loughna		*a.* and *s.*	*Grafton, Mass.*
Rumford, Clarence Henry	*A	*a.*	*Newfields.*
Saxton, Marjorie May		*h. e.*	*Manchester.*
Scammon, Chester Allen	A	*m. e.*	*Stratham.*
Shannon, Jennie Mae		*a.* and *s.*	*Epping.*
Smith, Arthur Dean	A	*for.*	*Andover.*
Smith, Deborah Beatrice		*h. e.*	*Newfields.*
Spinney, Willard Ellsworth	N	*ch. e.*	*Concord.*
Stafford, Henry Walton	*A	*a.*	*Berlin.*
Stott, George Phillip	*A	*a.* and *s.*	*Portsmouth.*
Stryker, Phebe Key		*a.* and *s.*	*George's Mills.*
Thompson, Elmer John		*a. h.* and *d.*	*Contoocook.*
Wallace, Grace Ireland		*h. e.*	*Manchester.*
Watson, George Wesley		*e. e.*	*Manchester.*
Weigel, Frederick Albert	N	*e. e.*	*Lawrence, Mass.*
Whipple, Gladys Louise		*a.* and *s.*	*Lebanon.*
Young, Ralph Joy	A	*a. h.* and *d.*	*Dover.*

SOPHOMORES

Aldrich, Kathryn Margaret		*h. e.*	*Lancaster.*
Anderson, Ernest August Franklin		*a.* and *s.*	*New Milford, Conn.*
Arey, Amber Priscilla		*a.* and *s.*	*South Danbury.*
Ayers, Hazel Marguerite		*h. e.*	*Rochester.*
Baker, Albert Samuel		*a.* and *s.*	*Concord.*
Batchelder, George Harold		*a.* and *s.*	*Hampton.*
Beane, Norman Rollins	*A	*ch. e.*	*Newington.*
Bearse, Norman Irving	A	*ch. e.*	*Nashua.*
Bennett, Robert Goodwin	A	*a.*	*Newmarket.*
Blood, Paul Tolman	A	*a.*	*Lisbon.*
Boody, Cecil Webster	A	*a.* and *s.*	*East Barrington.*
Bourdon, Irene Cecile		*a.* and *s.*	*Manchester.*
Boyd, Mary Anne Catherine		*a.* and *s.*	*Dover.*
Brown, Donald Stuart	A	*ch. e.*	*Laconia.*
Brown, Percival Cyrus	N	*m. e.*	*Woodstock.*
Bugbee, Rachel Rice		*h. e.*	*Concord.*
Burdett, Louise		*a.* and *s.*	*Leominster, Mass.*
Burgess, Richard Nelson	A	*a.*	*Nashua.*
Butler, Theodore Rutledge		*a.* and *s.*	*Portsmouth.*
Calpin, Arthur Raymond	**A	*e.*	*Manchester.*
Campbell, Ernest Weston	*A	*a.*	*Gonic.*
Carpenter, Richard Frederick	N	*a.* and *s.*	*Littleton.*
Cavis, Hortense		*h. e.*	*Bristol.*

Name	Section of S.A.T.C.	Course	P. O. Address
Chaplin, Daniel Reed	A	*a.*	*Keene.*
Chase, Dorothy		*a* and *s.*	*Smithtown.*
Child, Roswell Towle	N	*m. e.*	*Pembroke.*
Cleveland, Margaret Lily		*h. e.*	*Stowe, Vt.*
Cohen, Abraham Louis	A	*a.* and *s.*	*Portsmouth.*
Coker, Roland Stanwood	A	*a.* and *s.*	*Salem, Mass.*
Colburn, Ruth Emeline		*a.* and *s.*	*Temple.*
Colburn, Elmer Metford	*A	*a.*	*Somersworth.*
Colton, Leona Brewster		*h. e.*	*Boston, Mass.*
Connell, Morelle Meath		*h. e.*	*Rochester.*
Cotton, John Melville	A	*e. e.*	*Portsmouth.*
County, Lillian Gertrude		*a.* and *s.*	*Manchester.*
Craig, Thomas Jeffers		*ch. e.*	*Portsmouth.*
Cross, Clarence Arthur	A	*a.*	*Derry.*
Currier, Leslie Amos	*A	*prog. a.*	*Claremont.*
Daniels, Maurice Lewis	*A	*a.* and *s.*	*New Boston.*
Davis, Bernard Milan		*a.*	*Antrim.*
Davis, Louise Grosvenor		*a.* and *s.*	*Newton.*
Dodge, Charles Frank	*A	*e. e.*	*Contoocook.*
Dore, Nellie Jemima		*h. e.*	*Mirror Lake.*
Dow, Harold Wright	A	*m. e.*	*Warner.*
Dutton, Evelyn Florence		*h. e.*	*Dracut, Mass.*
Flanders, Dorothy Alice		*a.* and *s.*	*Laconia.*
Fluet, Rita Beatrice		*a.* and *s.*	*Dover.*
Forbes, Harland Clement	A	*e. e.*	*Colebrook.*
Ford, Harriet May		*a.* and *s.*	*South Danbury.*
Franklin, Jeremiah Edward	A	*m. e.*	*Franklin.*
French, Harold Gordon	A	*a.*	*Hudson.*
Gaw, Harold Edmund	*N	*m. e.*	*Manchester.*
Gerrish, Mary Elizabeth,		*h. e.*	*Dover.*
Grant, Leland Elford		*ch. e.*	*Salmon Falls.*
Hanscom, Grace May		*a.* and *s.*	*Somersworth.*
Hanscom, Florence Evelyn		*a.* and *s.*	*South Berwick, Me.*
Harding, Louise Eva		*a.* and *s.*	*West Lebanon.*
Hartwell, Robert William		*a.*	*Littleton, Mass.*
Hatch, Florence Durkee		*a.* and *s.*	*Exeter.*
Hauler, Arthur	A	*m. a.*	*Fitchburg, Mass.*
Hayes, Clifton Russell	*N	*e.*	*Dover.*
Hayward, Charles Prescott	**A	*a.*	*Temple.*
Hedburg, Irving Wilfred		*a.* and *s.*	*Worcester, Mass.*
Helff, Otto Maximilian	N	*a.* and *s.*	*Keene.*
Hennessey, Mary Margeret		*a.* and *s.*	*Dover.*
Hewitt, Ernest Warden		*e. e.*	*Durham.*

Name	Section of S.A.T.C.	Course	P. O. Address
Hill, Benjamin Franklin		*ch. e.*	*Dover.*
Hiscock, J. Austin	**A	*e. e.*	*Conway.*
Hobbs, Ethel Mae		*a.* and *s.*	*Somersworth.*
Hobbs, Horace Estow	A	*a.* and *s.*	*Hampton.*
Holmes, Myron Gerrish	A	*a.*	*Northwood.*
Hubbard, Oliver Jones	A	*a.*	*Walpole.*
Hunt, Raeburn Stanley		*a.* and *s.*	*Cornish Flat.*
Huse, Esther		*a.* and *s.*	*Manchester.*
Johnson, Ralph Nathan		*a.*	*Newport.*
Keene, LaRoy Dwight	A	*e. e.*	*Kittery, Me.*
Kelleher, Helena Katherine		*a.* and *s.*	*Dover.*
Kimball, Ralph Walter	N	*a.* and *s.*	*Milton.*
Knox, Alice Richardson		*a.* and *s.*	*Dover.*
Knox, William Edward		*e. e.*	*Dover.*
Ladd, Bessie Ruth		*a.* and *s.*	*Epping.*
Ladd, Frank Watson	N	*e. e.*	*Contoocook.*
Lagasse, Felix Scott	A	*a.*	*Lockmere.*
Langley, Delia Frances		*a.* and *s.*	*Durham.*
Lannon, John Martin	A	*ch. e.*	*Penacook.*
Leahy, Elinor Frances		*a.* and *s.*	*Somersworth.*
Leavitt, Harold Irving		*e. e.*	*Lowell, Mass.*
Levingston, Oscar	A	*a.* and *s.*	*Concord.*
Levy, Samuel		*a.* and *s.*	*Portsmouth.*
Litch, Richard Corning	N	*e. e.*	*Exeter.*
Little, Ernest Parker	A	*ch. e.*	*Concord.*
Lorden, Earl Eastman	N	*a.* and *s.*	*Gerrish.*
Lyford, Sidney John		*a.*	*Epping.*
McGettigan, Frances Lawrence	A	*a.*	*Wilton.*
McKelvie, Carl Donald	*A	*ch. e.*	*Nashua.*
McKenzie, Jr., George		*m. e.*	*Franconia.*
McWeeney, Annie Madaleine		*a.* and *s.*	*Nashua.*
Madden, Donald Burbank	A	*a.*	*Antrim.*
Marshall, John Samuel	A	*a.* and *s.*	*Kingston.*
Marston, James Richard		*a.*	*Conway.*
Martins, Abilio Pinto	**A	*a.* and *s.*	*Brazil, So. Am.*
Mattoon, Donald Potter	*A	*a.*	*Claremont.*
Meader, Helen Hawkes		*a.* and *s.*	*Dover.*
Meras, Norman Eugene	A	*e. e.*	*Exeter.*
Meserve, Anna Howard		*h. e.*	*Framingham, Mass.*
Mitchell, Basil Joseph		*e. e.*	*Nashua.*
Morrill, Alden Seth	A	*a.*	*East Bethel, Vt.*
Morrill, Edith Grace		*a.* and *s.*	*Penacook.*
Morse, Errol Stanley	A	*a.* and *s.*	*Tilton.*

Name	Section of S. A. T. C.	Course	P. O. Address
Murthur, Charles Bernard		*a.* and *s.*	*Nashua.*
Muzzey, Frank Elbridge	N	*m. e.*	*Derry.*
Newman, Denwood Austin		*ch. e.*	*West Burke, Vt.*
Nightingale, Burgess	A	*a.*	*Durham.*
Parmenter, Draper Watts	A	*a.*	*Hudson.*
Perry, Robert	A	*a.* and *s.*	*Manchester.*
Peterson, Henry Frederick	*A	*e.*	*Manchester.*
Pollard, Shirley Everett	N	*m. e.*	*Newport.*
Prescott, Frank Dunning	*N	*e.*	*Franklin.*
Reed, Harold Elwin	*A	*e. e.*	*Newport.*
Rees, Walford Tupper	*A	*a.* and *s.*	*Nashua.*
Remick, Frances Elizabeth		*a.* and *s.*	*Portsmouth.*
Richardson, Raymond Bradbury,		*a.*	*Gonic.*
Riel, Edmund George	A	*a.*	*Laconia.*
Rogers, Urban Charles	*A	*prog. a.*	*Berlin.*
Rollins, Howard Arthur	*A	*a.* and *s.*	*West Alton.*
Sawyer, Alfred Henderson		*a.*	*Concord.*
Scott, Alice Hovey		*a.* and *s.*	*Durham.*
Scovell, Paul Hayward	A	*m. e.*	*Haverhill, Mass.*
Shand, Dorothy Belle		*a.* and *s.*	*Manchester.*
Shaw, Clifton Frank	A	*a.* and *s.*	*Tilton.*
Shepherd, Charles William	A	*a.* and *s.*	*Sharon, Mass.*
Sherwood, Irving Frederick	*A	*prog. a.*	*Plymouth.*
Smith, Dwight George	*A	*prog. a.*	*Nashua.*
Smith, Clara Meredith		*a.* and *s.*	*Hollis.*
Smith, Louis Hutchinson		*a.*	*White River Jct., Vt.*
Soderland, Reginald Albanus	*A	*a.* and *s.*	*Manchester.*
Spinney, Emerson Sumner		*a.* and *s.*	*Portsmouth.*
Sprague, Marion Wilhelmina		*h. e.*	*Hinsdale.*
Stalker, Argyle McMorine	A	*a.*	*Newton.*
Stanley, Walter Packard		*a.* and *s.*	*Daytona, Fla.*
Stewart, Elmer Wadsworth		*a.* and *s.*	*Hanover.*
Taft, Lorado Edson		*a.*	*Gloucester, Mass.*
Tebbetts, Percy Frederick	*N	*e. e.*	*Somersworth.*
Thomas, Michael Simon		*e. e.*	*Durham.*
Thompson, Laurence Savoy	*A	*ch. e.*	*Tilton.*
Torrey, Frederick Lincoln	A	*prog. b.*	*Quincy, Mass.*
True, John George		*e. e.*	*Kensington.*
True, Oliver Lillian		*h. e.*	*West Lebanon.*
True, Laurence Melborn	A	*a.* and *s.*	*Hampton.*
Twaddle, Arthur Eastman		*m. e.*	*Manchester.*
Varrill, Roy Merton	A	*a.* and *s.*	*Newfields.*
Vose, Milton Reynolds	A	*a.* and *s.*	*Concord.*

Name	Section of S.A.T.C.	Course	P. O. Address
Walker, Kent	A	*a.*	*Newmarket.*
Wallis, Harriet Blanche		*h. e.*	*Laconia.*
Ward, Janet		*a.* and *s.*	*Hampton.*
Ward, Osborne Carleton	A	*a.* and *s.*	*Salem, Mass.*
Weeks, Charles Adelbert	*A	*prog. b.*	*Meredith.*
Weldon, Ralph Sharples	A	*a.*	*West Concord.*
Wentworth, Dorothy Pauline		*a.* and *s.*	*Dover.*
Wentworth, Russell Adams	*A	*prog. a.*	*Salmon Falls.*
Wentworth, Russell Gerrish	*A	*prog. a.*	*Farmington.*
Whitney, Orrin Calvin	*A	*prog. a.*	*Charlestown.*
Wiggin, Gilbert Newton	A	*e. e.*	*New London.*
Wiggin, Walter Wentworth	A	*a.*	*Sanbornville.*
Woodward, Bert Arthur	*N	*m. e.*	*Andover.*
Woodward, Howard True	A	*a.*	*Berlin.*
Wooster, George Edward	A	*a.*	*Concord.*

FRESHMEN

Abbott, Joseph Richard	*A	*prog. a.*	*Rumney.*
Allen, Robert Earl	**A	*a.* and *s.*	*Ashuelot.*
Alling, Stanley Joseph		*ch. e.*	*Dorchester, Mass.*
Andrews, Clifford Thomas	*A	*a.* and *s.*	*Manchester.*
Andrews, Leslie Arthur		*a.* and *s.*	*Quincy, Mass.*
Annance, Arthur E.	*N	*prog. a.*	*Greenville, Me.*
Armstrong, Leroy Morris	*A	*prog. a.*	*Amesbury, Mass.*
Austin, Norman Harlan	*A	*a.* and *s.*	*Laconia.*
Ayer, Perley Fernando	A	*prog. b.*	*Manchester.*
Badger, Carlton Burleigh	*A	*prog. a.*	*Portsmouth.*
Bagni, Martin Dante	*A	*prog. a.*	*Haverhill, Mass.*
Bailey, Edson Martin	A	*a.* and *s.*	*Sunapee.*
Bailey, George Austin	*A	*a.* and *s.*	*Woodsville.*
Bailey, George Edwin	*A	*ch. e.*	*Portsmouth.*
Baker, Bradley Locke	*A	*prog. b.*	*Concord.*
Barker, Ruth Morton		*h. e.*	*Antrim.*
Barrett, Clarence Austin	*A	*e.*	*Portsmouth.*
Barutio, Charles Woods	*A	*a.* and *s.*	*Portsmouth.*
Batchelder, William Pickering	A	*prog. a.*	*Salem, Mass.*
Batchelder, Victor Burr	A	*prog. a.*	*Laconia.*
Beane, Fred Ellsworth	*A	*a.* and *s.*	*Laconia.*
Bean, Gladys Helen		*a.* and *s.*	*Newfields.*
Beaudoin, Victor Francis	*A	*prog. a.*	*Berlin.*
Benfield, Elvira Libby		*h. e.*	*Exeter.*
Bennett, Fred Walter		*ch. e.*	*Bradford, Mass.*
Bennett, Harry James	*A	*prog. a.*	*Winchester.*

Name	Section of S. A. T. C.	Course	P. O. Address
Benson, Grant Gage	*A	*a.*	*Derry.*
Berry, Marion Emma		*a.* and *s.*	*North Hampton.*
Biddell, Sidney Miles	*A	*a.*	*Boston, Mass.*
Bingham, Harold Clinton	*A	*a.*	*Nashua.*
Bishop, Clarence Earle		*a.* and *s.*	*Sanbornville.*
Bishop, Floyd Eugene	N	*m. e.*	*Newport.*
Blodgett, Randolph Chandler		*e. e.*	*South Sutton.*
Bond, Arthur Towle	A	*a.*	*Lisbon.*
Boothman, Marion Louise		*a.* and *s.*	*Randolph.*
Boucher, James Neil	*A	*a.*	*Groveton.*
Boutwell, Llewellyn	A	*a.*	*Concord.*
Bowker, Leo Wallace	*N	*a.* and *s.*	*Keene.*
Bradley, Harold Timothy	**A	*ch. e.*	*Manchester.*
Brennan, George Edward	*A	*a.* and *s.*	*Dover.*
Brigham, Allen Everingham	*A	*prog. a.*	*Portsmouth.*
Broadley, Frank Joseph	*A	*prog. a.*	*Salem, Mass.*
Brock, Kenneth Heath	*A	*prog. a.*	*Fitchburg.*
Broderick, Sylvester James	A	*e.*	*Exeter.*
Brooks, Lester Fordyce	*A	*prog. b.*	*Errol.*
Brown, Harold Hubley	*A	*e. e.*	*Portsmouth.*
Brown, Norman Shirley	*A	*a.* and *s.*	*Haverhill, Mass.*
Brown, Raymond Chessman	A	*e.*	*Lancaster.*
Burleigh, Donald Knowles	A	*a.* and *s.*	*Tilton.*
Burnham, John Sheldon		*a.* and *s.*	*Antrim.*
Butler, Louis Alfred Boutilletti	N	*a.* and *s.*	*Worcester, Mass.*
Buzzell, Roy Harold	*A	*prog. a.*	*Laconia.*
Byrne, Daniel John	*A	*a.* and *s.*	*Concord.*
Cahill, John Henry	*A	*prog. b.*	*Milford.*
Calcutt, George Frederick	*A	*m. e.*	*Dover.*
Callahan, Henry Paul	*A	*a.* and *s.*	*Concord.*
Callahan, John Leadens		*e.*	*Littleton.*
Came, George Hazelton		*ch. e.*	*Somersworth.*
Campbell, George Lawrence	*A	*a.*	*Medford, Mass.*
Carpenter, Herbert Stoddard	A	*a.* and *s.*	*Lancaster.*
Carrigan, Robert Emmett	*A	*a.* and *s.*	*Meredith.*
Carter, Leslie Frederick	*N		*Hillsborough.*
Cassell, Harold David	*A	*m. e.*	*Dover.*
Cassidy, Vincent Harold	*A	*prog. b.*	*Chelsea, Mass.*
Cassillo, Nicholas Richard	A	*a.* and *s.*	*Keene.*
Chabott, Jr., Eli Joseph	*A	*prog. b.*	*Keene.*
Chase, Helen Evans		*a.* and *s.*	*Smithtown.*
Chesley, Guy Kenneth	A	*ch. e.*	*Rochester.*
Clark, George Melvin	*A	*prog. a.*	*Portsmouth.*

Name	Section of S. A. T. C.	Course	P. O. Address
Clark, Jr., Walter Ellery	*N	*e.*	*Franklin.*
Clough, Fletcher Harvey	*A	*prog. a.*	*Concord.*
Coffill, George Boyson	A	*a.* and *s.*	*Manchester.*
Colcord, Howard Edward	*A	*prog. b.*	*Province Lake.*
Cole, George Wallace	*N	*m. e.*	*Salem Depot.*
Collins, George Peabody	*A	*prog. a.*	*Lakeport.*
Collins, Thomas Murray	*A	*prog. a.*	*Rochester.*
Cook, Albert Spaulding	A	*a.* and *s.*	*Fremont.*
Cooley, Roland Robert	*A	*prog. a.*	*Wilton.*
Cooper, Arthur Gunyon	A	*prog. a.*	*Exeter.*
Cooper, Franklin Barlow	*A	*prog. a.*	*Salem Depot.*
Cooper, Lewis Swett	A	*prog. a.*	*Medford, Mass.*
Corson, Sidney Wingate		*e. e.*	*Rochester.*
Coutchoucas, Constantina		*a.* and *s.*	*Manchester.*
Cox, Isaac Newton	A	*m. e.*	*Manchester.*
Cox, Paul Nelson	*A	*a.*	*Newtonville, Mass.*
Cram, Donald Blick	*N	*a.* and *s.*	*Antrim.*
Crosby, Gordon Vaughan	A	*a.* and *s.*	*Groveland, Mass.*
Crosby, William Theodore		*e. e.*	*Groveland, Mass.*
Cross, Perley Thomas	*A	*prog. a.*	*Franklin*
Crossman, Harold George	*A	*prog. a.*	*Claremont.*
Croteau, Arthur Joseph	N	*m. e.*	*Marlborough.*
Currier, Preston H.		*e. e.*	*Plymouth.*
Dame, Norman Carleton		*e. e.*	*Rochester.*
Dana, Marshall Merritt	*N	*m. e.*	*Alstead.*
Darvill, Frederick John	N	*a.* and *s.*	*South Berwick, Me.*
Davis, Beryle Lucetta		*a.* and *s.*	*Plymouth.*
Davis, Dorothy Lillian		*h. e.*	*Warner.*
Dawson, Andrew McGrouther	A	*ch. e.*	*Methuen, Mass.*
Day, Henry Willis		*a.* and *s.*	*West Kennebunk, Me.*
Dearborn, Karl Brock	*A	*prog. a.*	*Belmont.*
Demers, Louis Alfred	*A	*e. e.*	*Gossville.*
Demers, Ovilla Henry	*A	*a.* and *s.*	*Manchester.*
Derby, Francis Hunter Howe	*A	*a.*	*Dorchester, Mass.*
deRochemont, Charles Wallace	A	*e. e.*	*Portsmouth.*
Desotelle, Louis Patrick	*A	*a.* and *s.*	*Dover.*
Dickinson, Carl Norman	A	*a.* and *s.*	*Nashua.*
Dion, Wilford Arthur	*A	*prog. a.*	*Tilton.*
Dodge, James Cassins	*A	*a.* and *s.*	*Nashua.*
Donovan, Frederick David		*a.*	*Ashuelot.*
Donovan, James Francis	*A	*prog. a.*	*Exeter.*
Doolittle, Irving Warren	A	*a.* and *s.*	*Portsmouth.*
Doran, Robert Harold		*a.*	*Littleton.*

Name	Section of S. A. T. C.	Course	P. O. Address
Doyle, Decima Inez		*a.* and *s.*	*Exeter.*
Dresser, Donald Sylvester		*e. e.*	*Berlin.*
Drown, Ernest Alvin	*A	*a.* and *s.*	*Alton.*
Drown, Herbert Leon	*A	*a.* and *s.*	*Wakefield.*
Dubeau, Joseph Dewey	*A	*m. e.*	*Derry.*
Ducey, James Joseph	*A	*a.* and *s.*	*Concord.*
Duffy, Wilfred Lincoln	A	*e. e.*	*Lawrence, Mass.*
Duggans, Walter Daniels	*A	*prog. b.*	*Worcester, Mass.*
Dunn, Henry Linwood		*a.* and *s.*	*Portsmouth.*
Dutton, Shelley Earle	*A	*prog. b.*	*North Haverhill.*
Duval, Romeo Onesime	*A	*prog. a.*	*Hillsborough.*
Emerson, Lester Straw		*e. e.*	*Pittsfield.*
Eastman, Chandler	A	*a.* and *s.*	*West Concord.*
Edwards, Ellerton Hoffman	*A	*prog. b.*	*Bennington.*
Eastman, John Edgar	*A	*prog. b.*	*Hampstead.*
Emery, Mayford Ezra	*A	*prog. a.*	*Andover.*
Evans, Harold Merrill		*ch. e.*	*South Hampton.*
Fernald, Langdon Dewey	*A	*prog. a.*	*Laconia.*
Fitzpatrick, John James	*A	*ch. e.*	*Milford.*
Flanders, Robert Charles		*a.* and *s.*	*Laconia.*
Ford, Henry Robert		*e. e.*	*Derry.*
Forrest, Isaiah Lord	*A	*prog. a.*	*Silver Lake.*
Foster, Dean K.	A	*a.* and *s.*	*Concord.*
Fountain, Joseph Andrew	*A	*a.* and *s.*	*Laconia.*
Fowler, Karl Raymond	A	*a.* and *s.*	*Lebanon.*
†Francis, Elmer Merritt	**A	*e. e.*	*West Newton, Mass.*
Freeman, Everett Orvis	*A	*prog. a.*	*Boston, Mass.*
French, Ford Elmer	*A	*e.*	*North Stratford.*
French, Francis Andrew		*e. e.*	*Wilton.*
French, Will Woodbury	*A	*prog. a.*	*Tilton.*
Gadd, Rodney Elliott	*A	*prog. a.*	*West Newbury, Mass.*
Gadd, Thomas Burden		*a.*	*Plymouth.*
Gale, Shirley Irving	A	*a.* and *s.*	*Lebanon.*
Garfield, John Thurston	**A	*m. e.*	*East Jaffrey.*
Garland, Guy Stanley	*A	*prog. b.*	*Hampton.*
Garvin, Jr., John Howard	*A	*prog. a.*	*Sanbornville.*
Garvin, Josiah Dow	*A	*e. e.*	*Sanbornville.*
Gay, Paul Baxter	*A	*prog. b.*	*New London.*
Germundson, Merrill Andrew	A	*prog. a.*	*Newton.*
Gilmore, Mildred Endora		*a.* and *s.*	*Hampton.*
Gilson, Henry Earl	*N	*m. e.*	*Windham.*
Glidden, Robert Leslie	*A	*m. e.*	*Dover.*
Glover, William Freeman	*A	*prog. a.*	*Exeter.*

Name	Section of S. A. T. C.	Course	P. O. Address
Goggin, Jeremiah Francis	A	*a.* and *s.*	*Dover.*
Goodwin, Crystal Evelyn		*a.* and *s.*	*Dover.*
Goold, John Exshaw	A	*e. e.*	*Hanover.*
Gordan, William Ezra	*A	*prog. a.*	*Concord.*
Gould, Audrey Elmer	*A	*a.* and *s.*	*Littleton.*
Gould, Freda Ross		*h. e.*	*Hanover.*
Gould, Verner Charles	*N	*prog. a.*	*Manchester.*
Gove, George Carroll		*m. e.*	*Raymond.*
Griffiths, Sadie Marion		*a.* and *s.*	*Durham.*
Hallisey, Dennis Leo	*N	*e.*	*Nashua*
Hallisey, Harold Jeremiah	*A	*prog. a.*	*Nashua.*
Hamblet, Theodore Clement	A	*prog. b.*	*Lawrence.*
Hammond, Don James	*A	*prog. a.*	*Colebrook.*
Haney, John Irving	*A	*prog. a.*	*Berlin.*
Hanson, Oscar Valdemar	*A	*prog. a.*	*Concord.*
Hardy, Frank Hildreth	*A		*Lowell, Mass.*
Hardy, Harry Dudley	*A	*prog. b.*	*Nashua.*
Harris, Lester Samuel		*a.* and *s.*	*Franklin.*
Hartford, Alfred Boune	*N	*a.* and *s.*	*Lancaster.*
Harvey, Franklin Sawyer	*A	*prog. a.*	*Chichester.*
Harvey, Franklin Watson	*N	*m. e.*	*Portsmouth.*
Harvey, Lester Schley	*A	*a.* and *s.*	*Manchester.*
Hawkins, Lewis Byron	*A	*a.* and *s.*	*Manchester.*
Hayes, Carl Dewey	*A	*prog. a.*	*Wolfeboro.*
Hayes, Theodora Edith		*h. e.*	*Wolfeboro.*
Healey, Lee Gladstone	*A	*a.* and *s.*	*Manchester.*
Heartz, Harold Francis	*A	*prog. a.*	*Exeter.*
Heartz, Robert Frederick	*A	*prog. a.*	*Exeter.*
Heller, Samuel Earle	*A	*prog. a.*	*Claremont.*
Henry, Arthur Francis	*A	*prog. a.*	*Concord.*
Henry, James Phillips	*A	*a.*	*Dorchester, Mass.*
Herlihy, John Edward	*A	*prog. a.*	*Newfields.*
Herrick, Robert Smith		*a.*	*Cambridge, Mass.*
Hewitt, Vivian Eloise		*a.* and *s.*	*Durham.*
Higgins, Martha Gorham		*a.* and *s.*	*Salem Depot.*
Hill, Kenneth Francis	*A	*a.*	*Centre Strafford.*
Hilliard, John Clinton	A	*prog. a.*	*East Kingston.*
Hoben, Margaret Egan		*a.* and *s.*	*Manchester.*
Hodgdon, Jr., Orrin Chandler	*A	*a.* and *s.*	*Penacook.*
Holland, James Ralph	*A	*prog. a.*	*Portsmouth.*
Holmes, Byron Lucy	A	*a.*	*Northwood.*
Holmes, Clayton William	*A	*prog. a.*	*Manchester.*
Holmes, Robert William	A	*m. e.*	*Dover.*

Name	Section of S. A. T. C.	Course	P. O. Address
Horne, Samuel Philip		*a.* and *s.*	*Bradford, Mass.*
Horne, William James	A	*a.* and *s.*	*Rochester.*
Hulburt, Leburton Blodgett	*N		*Lexington, Mass.*
Hurd, Paul Delloss		*a.* and *s.*	*Sanford, Me.*
Hutchinson, Philip Hiram	*A	*prog. a.*	*Concord.*
Hyde, Rhoda Alettha		*h. e.*	*East Kingston.*
Ingham, Howard Vincent	A	*a.*	*Lowell, Mass.*
Irish, Robert Jasper	A	*a.* and *s.*	*Wolfeboro.*
Jackson, Harold George	*A	*prog. a.*	*Groveton.*
Jacques, Henry Joseph	*A	*prog. a.*	*Rochester.*
Jacques, Laura Gertrude		*a.* and *s.*	*Ashland.*
Jacques, Omer Charles	N	*e.*	*Ashland.*
Jameson, Ruth Agnes		*a.* and *s.*	*Cornish.*
Jeneau, Rudolph	*A	*e. e.*	*Somersworth.*
Jenne, Aldred Augustus	*A	*prog. a.*	*Haverhill, Mass.*
Johnson, Andrew Joseph	*N	*prog. a.*	*Lebanon.*
Johnson, Frederick Knowlton		*m. e.*	*Winthrop, Mass.*
Johnson, Nelson Peterson		*a.* and *s.*	*West Lebanon.*
Johnson, Newell Byron	*A	*prog. a.*	*Berlin.*
Jones, Jr., Edwin Clifford	*N	*a.* and *s.*	*Norwood, Mass.*
Jones, Frank	A	*a.* and *s.*	*New Durham.*
Jones, Maurice Avery	*A	*prog. a.*	*Concord.*
Jones, Robert Edgar	*A	*prog. a.*	*Penacook.*
Junkins, Frank Leroy	*A	*prog. a.*	*Exeter.*
Keane, Francis Aloysius	N	*m. e.*	*Manchester.*
Keefe, James Francis	*N	*ch. e.*	*North Wilbraham, Mass.*
Keenan, John Herbert	*A	*prog. a.*	*Berlin.*
Kelley, Parker Westbrook		*a.* and *s.*	*Dennisport, Mass.*
Kelsey, Dorothy Isabelle		*h. e.*	*Meriden.*
Kelsey, Howard Phelps	A	*prog. a.*	*Meriden.*
Kemp, Ralph Bradstreet	*N	*prog. a.*	*Kingston.*
Kennison, Ralph	*A	*a.* and *s.*	*Newton.*
Keyes, Charles Henry	*A	*m. e.*	*Hollis.*
Kimball, Elmer Winton	*A	*prog. a.*	*Newmarket.*
Knight, Ruth Elizabeth		*a.* and *s.*	*Exeter.*
Knowles, Charles Theodore	*N		*South Berwick, Me.*
Kurtz, Maurice		*a.* and *s.*	*Manchester.*
Lachowicz, John Stanley		*a.* and *s.*	*Middletown, Conn.*
LaCombe, Harvey Joseph	*A		*Groveton.*
Lamb, Harold George	*A		*Langdon.*
Lang, Arthur Harold	*A	*a.* and *s.*	*Newmarket.*
Lawrence, Oakes Kent		*a.*	*Tilton.*
Leach, William Arthur	A	*a.*	*Moultonborough.*

Name	Section of S. A. T. C.	Course	P. O. Address
Leath, Cecil Eldon		*e. e.*	*So. Milford, Mass.*
LeBlanc, Mederick Joseph	*A	*a.* and *s.*	*Concord.*
Leblond, George Albert	*A	*a.* and *s.*	*Rochester.*
Leonard, Janice Marjorie		*h. e.*	*Worcester, Mass.*
LeVangie, Eugene David	*A		*Newfields.*
Leveroni, Jr., Lawrence Paul	N	*a.* and *s.*	*Keene.*
Lord, Augustus H.	*A		*Dover.*
Lougee, Floyd Harold	**A	*a.* and *s.*	*Laconia.*
Lyster, Paul Jones	A	*a.*	*Littleton.*
McDonagh, Margaret Pauline		*a.*	*Concord, Mass.*
MacDonald, John Henry	*A		*Bethlehem.*
MacDonald, Ray Ellsworth	A	*m. e.*	*Manchester.*
McCann, Patrick Edward	*A	*a.* and *s.*	*Concord.*
McCarthy, Daniel Harold	*A	*a.* and *s.*	*Dover.*
McDuffee, John		*a.* and *s.*	*Rochester.*
McGee, Irving J.	*A		*Berlin.*
McGoff, Marjorie Ida		*a.* and *s.*	*Concord.*
McKay, John Cameron	*A	*m. e.*	*Nashua.*
McKeen, Donald Sidney	*N	*normal*	*East Kingston.*
McKerley, Stillman Ernest	A	*a.* and *s.*	*Gerrish.*
MacLatchey, Gordon Francis		*m. e.*	*Sunapee.*
McNeil, Clarence William	A	*ch. e.*	*Lebanon.*
McNulty, Elizabeth Mary		*a.* and *s.*	*Manchester.*
Macfarlane, Katherine		*a.* and *s.*	*Durham.*
Maine, Percy Ray	*A	*m. e.*	*Haverhill, Mass.*
Mansell, Maurice Ames	A	*a.*	*Old Town, Me.*
March, Elwin Allerson	*A	*a.*	*Nashua.*
Marsh, George Henry Clay	A	*a.* and *s.*	*Nashua.*
Marsh, Murray Bryan	*A		*Canaan, Vt.*
Marsh, Robert French		*ch. e.*	*Manchester.*
Marshall, Leonard Joseph		*m. e.*	*Salem Depot.*
Marshall, Nathalie Emerson		*h. e.*	*Henniker.*
Marston, Lester Woodbury	*N	*a.* and *s.*	*Dover.*
Martin, Adams		*e. e.*	*Pembroke.*
Matthews, Frank Moses	*N	*e.*	*Cape Neddick, Me.*
May, William George		*a.* and *s.*	*So. Deerfield, Mass.*
Meader, Carleton Eugene	*A	*a.* and *s.*	*Rochester.*
Meader, Jr., Walter Sidney	A	*e. e.*	*Dover.*
Merrill, Forest Winn	*A	*a.*	*Lowell, Mass.*
Merrill, Glen Wesley	**A	*normal*	*Norwich, Vt.*
Meserve, Howard Haley	*A	*a.*	*Framingham, Mass.*
Messenger, Herbert Dickinson		*a.*	*East Boston, Mass.*
Mooney, Harry Justin	*A		*Laconia.*

Name	Section of S. A. T. C.	Course	P. O. Address
Moore, Ralph Henry	*A		*Laconia.*
Morgan, Ralph Allen	*A	*e. e.*	*Lebanon.*
Moriarty, James Joseph	A	*a.*	*Fitchburg, Mass.*
Morin, Paul Emile	*A	*normal*	*Berlin.*
Morrison, Clifton Cole		*m. e.*	*Ashland.*
Morse, Cedric Earle	*A	*a.* and *s.*	*Haverhill, Mass.*
Munro, Leo Franklin	A	*m. e.*	*Groveton.*
Nelson, Charles William	A	*ch. e.*	*West Thornton.*
Neville, Mark Anthony	*N	*a.* and *s.*	*Portsmouth.*
Nichols, George Edwin	N	*ch. e.*	*Hopedale, Mass.*
Northey, Roscoe Lee	A	*a.* and *s.*	*Lisbon.*
Noyes, Chester Drew	*A	*normal*	*Colebrook.*
Noyes, George Allen	*A		*Colebrook.*
Noyes, Roland Isaac	*A	*a.* and *s.*	*Hampton.*
Nute, Norwood		*e. e.*	*Exeter.*
Nutter, Robert Peary	A	*a.*	*South Portland, Me.*
O'Leary, Michael Francis	A	*a.* and *s.*	*Portsmouth.*
Olsson, Gunnar Bror		*a.*	*Chichester.*
O'Neil, William Joseph	*A	*e.*	*East Pepperell, Mass.*
Osgood, Harold Keene	**A	*a.* and *s.*	*Haverhill, Mass.*
Osgood, Paul S.	A	*a.* and *s.*	*Rochester.*
Paine, Lorin Dresser		*a.* and *s.*	*Berlin.*
Paquet, Edward Joseph	*N	*m. e.*	*Derry.*
Paquet, Raphael Arthur	*A		*Peterborough.*
Parshley, Richmond Hobson	*A	*a.* and *s.*	*Rochester.*
Parsons, Warren Clough	*A	*a.* and *s.*	*Rochester.*
Partington, Clyde Nash		*a.*	*Dover.*
Pease, Percy Elmer	*N	*a.* and *s.*	*Laconia.*
Pelissier, Adelard Rudolph	*A	*e. e.*	*Pittsfield.*
Penwell, Kenneth Clayton	*A	*a.* and *s.*	*Haverhill, Mass.*
Perkins, Harold Linscott	*A		*Exeter.*
Perley, Ronald Prime	*A		*Rowley, Mass.*
Perry, Laurence Bernard	*A		*Portsmouth.*
Pettingill, Helen Mary		*a.* and *s.*	*Salisbury, Mass.*
Pike, Randolph Kelley	*A	*a.*	*Laconia.*
Piper, Richard Young	*A	*e. e.*	*Stratham.*
Platt, Charles Grandison	*A	*normal*	*Stratford.*
Plummer, Robert Nathan	*N	*a.*	*Derry.*
Plummer, Raymond Swain	A	*m. e.*	*Laconia.*
Pothier, Raymond Adolphe	**A	*m. e.*	*Haverhill, Mass.*
Potter, Lynn Emery		*a.* and *s.*	*Lebanon.*
Preo, Richard Lionel	*A	*normal*	*Berlin.*
Prince, Arthur Stanley	*A		*Salisbury.*

Name	Section of S. A. T. C.	Course	P. O. Address
Proctor, Ralph Harwood		*a.* and *s.*	*Antrim.*
Pulsifer, Benjamin Franklin	*A	*prog. b.*	*Lewiston, Me.*
Putnam, Dorothy Alice		*a.* and *s.*	*Greenfield.*
Quimby, Lawton Buzzell		*a.*	*Laconia.*
Quirk, John Ignatuis	*A		*Portsmouth.*
Randlett, Norman Prescott	A	*a.* and *s.*	*Laconia.*
Ready, Joseph Francis	*A	*a.*	*Manchester.*
Reardon, Edward Dennis	**A	*m. e.*	*Concord.*
Reardon, Honora Agnes		*ch. e.*	*Concord.*
Renehan, Donald Edwin		*a.* and *s.*	*White River Jct., Vt.*
Rice, Andrew Carl	A	*ch. e.*	*Wilbraham, Mass.*
Rice, Neal James		*a.*	*Contoocook.*
Rider, Edward Alvin	*A	*a.*	*Laconia.*
Roach, William Patrick	*A	*a.*	*Berlin.*
Roberge, Benjamin Grandiose	*A	*a.*	*Somersworth.*
Robie, Edison Frank	*A	*prog. a.*	*Derry.*
Robinson, George	*A	*prog. a.*	*Suncook.*
Robinson, John McDonald	*A	*prog. b.*	*Haverhill.*
Rodenhiser, Herman Alonzo	*A	*m. e.*	*Henniker.*
Rolston, Frank Gordon	*A	*prog. a.*	*Greenland.*
Rose, George Clark	*A	*prog. a.*	*Suncook.*
Rossell, Joseph Frederick		*a.* and *s.*	*West Concord.*
Rowden, Henry Thomas	*A	*a.* and *s.*	*Woodsville.*
Rowe, Stacy Buzzel	*A	*prog. a.*	*Newton.*
Rowe, Walter Stuart	*A	*prog. b.*	*Derry.*
Rowell, Richard Irving	A	*m. e.*	*Newport.*
Rumazza, Edward Frederick	A	*e. e.*	*Rochester.*
Russell, Bruce Eldridge,		*a.*	*Mont Vernon.*
Russell, Jr., Charles Clifton	A	*e. e.*	*Exeter.*
Russell, Clarence Rufus	A	*a.* and *s.*	*Exeter.*
Russell, Jr., Fred Cutler		*a.* and *s.*	*Haverhill.*
Russell, Leonard Everett	*A	*a.*	*Danvers, Mass.*
Sager, Ronald Frederick	*A	*prog. a.*	*Salem, Mass.*
Sanders, Ernest Frank	*N	*prog. a.*	*Dover.*
Sanguinet, George Alphonse	*A	*a.* and *s.*	*Worcester, Mass.*
Sargent, Katherine Morse		*a.* and *s.*	*Exeter.*
Saunders, Arthur Bruce	A	*ch. e.*	*Nashua.*
Saunders, Charles	*N	*normal*	*Keene.*
Savage, Thomas Walter	*A	*e.*	*Bristol.*
Sautelle, Elanor Prescott		*a.* and *s.*	*Manchester.*
Sawyer, Robert Cushman	A	*a.* and *s.*	*Concord.*
Scott, Elmer Arthur	A	*ch. e.*	*East Wakefield.*
Seavey, Ervin Gustavus	*A	*prog. a.*	*Portsmouth.*

Name	Section of S. A. T. C.	Course	P. O. Address
Seymour, Joseph Wilfred	*A	*a.* and *s.*	*Laconia.*
Shapiro, Maurice David		*e. e.*	*Portsmouth.*
Shea, Theresa		*a.* and *s.*	*Nashua.*
Shea, Thomas Edward	*A	*a.* and *s.*	*Nashua.*
Shute, Charles Elmer	*A	*prog. a.*	*West Newbury, Mass.*
Simonds, Stephen Moses	A	*a.* and *s.*	*Lisbon.*
Slight, William Henry		*a.* and *s.*	*Haverhill.*
Smart, Earl Thompson	*A	*prog. a.*	*Portsmouth.*
Smith, Charles Wesley	A	*e. e.*	*Portsmouth.*
Smith, Roland Alvin	*A		*Pittsfield.*
Smyrl, Elvin Leslie	*A	*prog. a.*	*Manchester.*
Snow, Ernest Luther	*A	*prog. a.*	*Walpole.*
Snow, Howard King	*A	*prog. a.*	*Lancaster.*
Snyder, Edward Charles	*A		*Lisbon.*
Spain, Joseph Stephen	*A	*a.* and *s.*	*Concord.*
Spaulding, Albert Edward	*A	*e.*	*Bradford, Mass.*
Spinney, Fannie Mae		*a.* and *s.*	*Dover.*
Sprague, M. Gertrude		*h. e.*	*Hinsdale.*
Stanley, Stillman Gay	A	*m. e.*	*New London.*
Staples, Harold Sanborn	*N	*a.* and *s.*	*Dixfield, Me.*
Stearns, Frank Leslie	*A	*e. e.*	*Manchester.*
Stearns, William Lowell	*N	*m. e.*	*New London, Conn.*
Stevens, Hope		*a.* and *s.*	*Exeter.*
Stevens, William Arthur	*A	*prog. a.*	*Concord.*
Stewart, Arthur Porter	*A	*e.*	*Hanover.*
Stewart, Robert	*N	*normal*	*Danbury.*
Stickney, Irving Edwin	*A		*Hampton.*
Stimson, Erville Rupert	*A	*e. e.*	*Woodsville.*
Stimson, Kirk Keith	*N	*normal*	*Milford.*
Storey, Edward Jerome		*e. e.*	*Sanbornville.*
Stratton, William Merrill	A	*a.* and *s.*	*Manchester.*
Strong, Carlton Matthew	N	*e. e.*	*Concord.*
Swain, Charles Andrew	A	*a.* and *s.*	*Nashua.*
Swasey, Mildred Hadda		*h. e.*	*Exeter.*
Taylor, Millard Renshaw		*ch. e.*	*Dover.*
Thayer, Royal Goodell		*a.*	*St. Albans, Vt.*
Thibaudeau, Philippe Arthur	*A	*prog. a.*	*Manchester.*
Thompson, Donald Tuttle		*a.* and *s.*	*East Andover.*
Thompson, Katherine		*a.* and *s.*	*East Andover.*
Tilton, Paul Josiah	*A	*prog. a.*	*Raymond.*
Tingley, Edythe May		*a.* and *s.*	*Durham.*
Tirrell, Philip Mason	*A	*prog. a.*	*South Lyndeborough.*
Toner, John Walter Meegan	A	*e. e.*	*Portsmouth.*

Name	Section of S. A. T. C.	Course	P. O. Address
Towle, Clayton Woodbury	A	*ch. e.*	*Conway.*
Towle, Joseph Henry	*A	*prog. a.*	*Conway.*
Towle, William James	*A	*prog. a.*	*Lebanon.*
Tripp, Harold James	*A	*e. e.*	*Epsom.*
True, Jr., George Lewis		*a.* and *s.*	*Freeport, Me.*
Tupper, Harold Fisk	A	*m. e.*	*Nashua.*
Turner, Howard Edmundson		*e. e.*	*Salem.*
Upham, Earle Murray	*A	*ch. e.*	*Salem, Mass.*
Wadleigh, Wilford Roys	*A	*prog. a.*	*Claremont.*
Wakefield, Robert Grosse	*A	*normal*	*Plymouth.*
Walch, Myron Swallow	*A	*prog. b.*	*Hollis.*
Ward, Arthur Thomas	*A	*prog. a.*	*Nashua.*
†Ward, Everett Gilman	*A	*e. e.*	*Laconia.*
Warner, Norwood Allen		*m. e.*	*South Yarmouth, Mass.*
Watkins, Robert Ellbridge		*e. e.*	*Reed's Ferry.*
Weeks, Chester Russell	*A	*m. e.*	*Pittsfield.*
Weston, Gail Berry	**A	*normal*	*Derry.*
Weston, George Washington	A	*a.*	*Wilton.*
Weston, John Prentiss	A	*a.*	*Bennington.*
Wheeler, Stephen Morse	*A	*a.* and *s.*	*Atkinson.*
White, Charles Curtis	*A		*Haverhill, Mass.*
Whittier, Helen		*a.* and *s.*	*Gossville.*
Whittimore, Salon Dolloff	*A	*m. e.*	*Hanover.*
Wiegand, Albert John		*a.* and *s.*	*Great Fall, Mont.*
Wiggin, Ernest Rankin	*A	*prog. b.*	*North Berwick, Me.*
Wiggin, Russell Morrison	A		*Whitefield.*
Willey, George Nute	*A	*e.*	*Newmarket.*
Williamson, Ernest Barrett	*A	*prog. a.*	*Brookline, Mass.*
Wilson, Carl Carty	*A	*prog. a.*	*Portsmouth.*
Wingate, Carleton Norman	*A	*prog. a.*	*Rochester.*
Winslow, George Washington	*N	*e.*	*Dover.*
Wood, Ethel Evelyn		*h. e.*	*Bath.*
Wood, Harold Barnette	A	*e. e.*	*Portsmouth.*
Yeaton, Conrad Dewey	*A	*prog. a.*	*East Pepperell, Mass.*
Yeaton, George Samuel		*m. e.*	*Short Falls.*
Young, Alvin Eugene	*A	*prog. a.*	*Winchester.*
Young, Esther Hale		*a.* and *s.*	*Dover.*
Young, Hamblet Waterman	*A	*prog. a.*	*Manchester.*
Yuskauskas, Joseph John		*e. e.*	*New Haven, Conn.*

†Deceased.

STUDENT LIST

TWO-YEAR AGRICULTURAL MEN

Second Year

Name	Section of S. A. T. C.	Course	P. O. Address
Ajemian, Souren Seghpos		*a. h.* and *d.*	*Portsmouth.*
Evans, Paul Blodgett	A	*a.*	*Nashua.*
Grimes, Freeman Mark	A	*a.*	*West Medford, Mass.*
Main, Arthur Roscoe		*a. h.* and *d.*	*Melrose Highl'ds, Mass.*
Northrup, Harley Frederick		*a. h.* and *d.*	*Williamstown, Mass.*

First Year

Barker, Carl Warren	A	*a.*	*Stratham.*
Bauer, Monroe		*a.*	*Flatbush, N. Y.*
Batchelder, Phillip		*a.* and *s.*	*Durham.*
Cleveland, Hollis Hove	A	*a.*	*Peterborough.*
Dailey, James Dewey		*a.*	*Madbury.*
Dexter, Douglas Hibbard	A	*a.*	*Lisbon.*
Gussman, Ralph		*a.*	*Roxbury, Mass.*
Hartwell, Reginald Warner		*a. h.* and *d.*	*Laconia.*
Rowe, George Joseph		*a.*	*North Charlestown*
Silver, Joseph Clarence	A	*a.*	*New Ipswich.*

SPECIAL STUDENTS

Sleeper, Lora Ella	*h. e.*	*Concord.*
Stevens, Clark Leavitt	*drawing*	*Colebrook.*
Tyler, Olive Mary	*h. e.*	*Worcester, Mass.*
Wallace, Kathleen Nesbitt	*a.* and *s.*	*Wolfeboro.*

SUMMARY OF REGISTRATION, 1917–1918

COMPARED WITH REGISTRATION FIGURES FOR PREVIOUS YEAR

	Army*	Agriculture												Arts and Science								Engineering								Men**		Women**		Total**	
		Reg.		Gen.		A.H.&D.		For.		Hort.		Total		Gen.		H.E.		M.A.T.		Total		Ch.E.		E.E.		M.E.		Total							
		'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19	'17 '18	'18 '19
Seniors	.....	...	...	6	3	10	6	2	1	5	...	23	10	24	26	9	18	....	2	33	46	7	4	4	1	2	5	13	10	49	33	20	33	69	66
Juniors	3	...	...	3	1	6	11	1	2	3	...	13	14	27	41	19	16	1	3	47	60	10	10	4	8	3	7	17	25	42	57	35	42	77	99
Sophomores	13	24	34	...	...	....	....	...	...	...	...	24	34	58	66	15	14	2	1	75	81	12	11	17	17	8	11	37	39	93	107	43	47	136	154
Freshmen	182	48	26	...	...	....	....	...	...	...	...	48	26	94	136	21	12	2	....	117	148	21	21	33	39	19	36	73	96	178	227	60	43	238	270
Total, 4-yr. students	198	72	60	9	4	16	17	3	3	8	...	108	84	203	269	64	60	5	6	272	335	50	46	58	65	32	59	140	170	362	424	158	165	520	589
2d-yr. Two Year	.....	8	5	...	...	....	....	...	...	...	...	8	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	8	5	....	....	8	5
1st-yr. Two Year	.....	24	9	...	...	....	....	...	...	...	...	24	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	24	9	....	....	24	9
Graduates	.....	...	...	...	...	....	....	...	...	...	...	...	...	2	...	...	...	....	....	2	...	...	...	...	...	...	...	...	...	1	....	1	....	2	....
Specials	.....	2	...	...	...	....	....	...	...	...	...	2	...	5	1	...	2	....	....	5	3	...	...	1	...	...	...	..1	1	4	1	4	3	8	4
Total, others	.....	34	14	...	...	....	....	...	...	...	...	34	14	7	1	...	2	....	....	7	3	...	...	1	...	...	...	...	1	37	15	5	3	42	18
Total, all students Regular courses		106	74	9	4	16	17	3	3	8	...	142	98	210	270	64	62	5	6	279	338	50	46	59	65	32	59	141	171	399	439	163	168	562	607
Sec. B (S. A. T. C.)																																			
Auto truck	308	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Concrete	197	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Carpentry	339	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Electrical	206	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Blacksmith	50	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Machinist	87	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Gas Engine	42	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Drafting	7	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Cooks & Bakers	17	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Clerks	16	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....
Total, "B"	1,269	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....

SUMMARY, 1918–1919

Number students registered in Regular College courses	607
Number students registered in Special Military Programs—Sec. A	198
Number students registered in Special Military Programs—Sec. B	1,269
Total number of students trained at New Hampshire College, 1918–19	2,074

* Members of the Students' Army Training Corps (including Navy Division) taking the Special Military Programs. Other S. A. T. C. men are included under the Regular Division Programs. See the Historical Sketch in this catalog for further details.

** Total, exclusive of members of Students' Army Training Corps taking special Military Programs as shown in the first column headed "Army."

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